The Builder.

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Ancient Buildings and "Restoration."

A GREAT deal has been said during the last week or two by various correspondents in the leading journal on what has for some time been a "burning question," — the principle on which ancient buildings are to be added to, "restored," or let alone. The most contradictory opinions have been expressed, both by those who have good claims, from their special knowledge and education, to speak on the subject, and by those who have none, but who, for reasons we do not pretend to understand, have obtained the opportunity to pose as lecturers on architecture and architectural propriety to a public which, unfortunately, for the most part, knows too little about the subject to discriminate between one guide and another; perhaps, we may add, cares too little to attempt to discriminate.

A great deal of the apparent confusion and contradiction about the subject really arises from the fact that those who argue about it constantly mix up together in their considerations what are really three distinct questions. There is, first, the question of making architectural additions to ancient buildings. Next, that of "restoring," as it is called, those portions of an ancient building which have become dilapidated, and have lost, by ordinary wear and weather, or by defacement at the hands of former generations, portions of their detail. Thirdly, there is the question of the preservation of ancient remains which are in an actual state of ruin, but which are of high interest or beauty, even as relics of what they once were.

This latter, or third head, may be dismissed briefly, as it is not complicated by any of the difficulties which beset the other two branches of the subject. No educated people differ on this point, that disused remains or "ruins" exhibiting ancient architectural workmanship, or showing anything of the plan and arrangement of buildings erected under conditions of life which have passed away and become a portion of history, are, even when little of beauty is left in them, relics of great historical value and interest, and that it is a duty we owe both to ourselves and to students who may come after us, not to allow them to subside into further ruin or actual obliteration. Where, indeed, such remains are found in crowded cities, there will sometimes arise the question whether their preservation should be allowed to stand in the way of much-needed modern accommodation or improvements. For such cases it is impossible to make a rule; each must be decided on its own merits, and on the comparative value of the remains. Where these are not of very ancient date or of unique interest, it is foolish to insist, as some in a spirit of blind antiquarian bigotry would insist, on their retention at the expense of the comfort and convenience of the present generation. There are other cases, such as that of the Roman remains at Bath, to which we referred last week, where the remains, though dilapidated in themselves, are of such special historical interest that a sacrifice ought to be made to preserve them intact; and probably the more education progresses the more generally will this be felt and admitted. In the case of ruins standing, as most of our most valuable examples do, in open spaces in the country, the question is merely one of responsibility,—not of what ought to be done, but who ought to do it. Mr. Hamo Thornycroft has called attention to the threatened decay of the remains of the Roman villa at Brading, for want of proper protection; and Mr. Loftus Brock, in a long and able letter to the *Times* of the 13th, on the subject which he understands so well, suggests that the provisions of the Ancient Monuments Bill of 1882, which at present are only applicable to what are called "prehistoric monuments," should be revised and extended so that the owner of a Norman keep or a ruined abbey may constitute the Commissioners of Works the guardians of such monument, as at present the owner of a dolmen or a British pit dwelling may do. There would be some opposition, no doubt, on the part of those who delight to call themselves "practical people," against devoting public money to these purposes; but public opinion has been somewhat educated since the absurd opposition to the early stages of Sir John Lubbock's Bill, and perhaps people may recognise in time that it is an ignoble thing for a country to be careless and indifferent about the monuments of its past history.

The question of the repair or restoration of buildings in actual use and occupation is a much more complicated one. The question of St. Mark's has been the subject of some fencing between Mr. Aitchison and a correspondent in the *Times*, who signs himself "Beo," and who absurdly charges modern architects with not being original, and not making a style of their own, as if any individuals or even any generation ever did or could make a style of architecture, of deliberate forethought. He overstates the case, however, when he says that no original details are designed by modern architects. The real fact is that all architectural detail, by the architects of any age, has been a development from the work of their predecessors; the greatest originality that can be credited to any one generation of architects has been to improve on or develop something better, or something different ("lest one good custom should corrupt the world") from the work of their predecessors. Really, we believe the truth to be that there is more originality in the works of many of the best English and French architects at the present moment than there has been in most former periods of architectural history, and that perhaps the fault even lies, in some quarters, in a rather too restless straining after being original. This, however, is by the way. Mr. Aitchison hardly makes a happy parallel in comparing the restoration of features which have decayed on an ancient building with the restoration of the lost books of Livy. The work of Livy was a literary record of facts,—or what Livy believed to be facts; it was a work written to give information, which, except in the case of pure poetry, is the primary object of a literary work. Now, the object of the builders of St. Mark's was not to give information to posterity, but to build a grand church; as "Beo" puts it (and he certainly scores a point there), "St. Mark's was built for worship, and not for the education of the S.P.A.B." We are speaking now, not of large additions, such as a new façade to a building, but of the execution of new details where old have perished. Where these are of the nature of purely conventional architectural detail, such as mouldings or a band of repeated ornament, we certainly cannot see that it is an act of vandalism or falsehood to fill up the gaps and render the architectural design complete again. It is that question of architecture as *design* which is in danger of being entirely forgotten in the present rather exaggerated worship of architecture as *history*. When we come to sculpture and painting the case is different; though in the matter of purely decorative sculpture it is sometimes rather difficult to decide. Mr. Aitchison instances the case of the north portal of Rouen Cathedral, where he saw new sculpture being executed in 1853 in place of that which had absolutely perished. The carver told him that he invented the subjects and carved them in the style of those that were left. Now if these were a series of figures in niches, such figures are really, in many Mediæval buildings, only a rather higher form of architectural decoration; their effect as a whole is of more value than individually. If the sculptor had, as Mr. Aitchison contends he should, executed figures in the style of his own day, the architectural unity of the whole would certainly have been broken up. The effect would have been a patchwork. Better, perhaps, to leave the niches unfilled, and, perhaps, that is what Mr.

Aitchison would prefer. In the case of mosaic pictures we come more into the region of a special art distinct from, though connected with, architecture; and here we must say that the process of piecing up old mosaics, which we understand is being carried on at St. Mark's, so that "it is difficult to determine where the old ends and the new begins," is a proceeding absolutely senseless, unless it concerns only decorative design, of which the parts remaining give the design of the whole. When it concerns anything like pictorial work, properly so called, if the modern proprietors of the church think their place of worship wants renovation, let them put the fragmentary mosaics in a museum, and get as good work as modern genius will supply in its place; but piecing up an old picture (whether in mosaic work or other method) with work intended to give the idea that the whole is complete in its original style, is absurd: it is spoiling the old work and fettering and misusing the talents of the modern artist.

The question of St. Mark's has brought out a letter from Mr. Arthur Street on the old subject of the alleged symbolism of the "wavy" floor, concerning which the reader who is interested had better take notice of a letter signed "Delta," which we print in another column, and which is by a careful and competent observer, who has paid considerable attention to the subject. The Latin quotation at the close of Mr. Street's letter in the *Times* is curious, and seems to afford some kind of ground for the supposition; but he does not say from what source it comes; and other remarks in the letter seem to be rather a repetition of what the late Mr. G. E. Street has already said on the subject. We have always been exceedingly sceptical about the alleged symbolism of the incident; for the double reason that, although it is true, as Mr. Street says, that Mediæval architecture was much charged with symbolism, yet to do a thing so practically inconvenient as to make an uneven floor for the sake of a symbol, seems a very improbable whim for any builders in possession of their senses; secondly, for the still stronger reason that the nature of the site on which St. Mark's is built seems to afford a much more probable explanation of the fact. Mr. Street should give the origin of his quotation about the floor of St. John the Evangelist at Ravenna in the fifth century; he only says, "we are told," which is not a satisfactory way of quoting; and the period referred to is too far antecedent to that of St. Mark's to have much weight as a probable precedent.

The third division of the subject is where we are concerned with actual additions to an ancient building, concerning which Lord Grimthorpe and Canon Venables have been keeping up a smart controversy. Putting the rudeness out of the question (and we suppose Lord Grimthorpe, in his public utterances at all events, cannot help being rude, and is to be pitied for his temper), it appears to us that Lord Grimthorpe is perfectly right in his theory of the subject, and in his estimate of his opponents' theories; he is very amusing (in a sense) and often very convincing when he is only writing about architecture: it is when he gets to building that he does the mischief. Canon Venables calls the west front of St. Alban's "Brummagem"; so do we, only for different reasons. Canon Venables calls it so because it is a modern Gothic front to an ancient Gothic church. We call it so because it is bad, clumsy, second-rate modern Gothic, done by men who do not understand the refinements of the style, and as such is a blot on the great building to which it is attached. Canon Venables, we gather, would have had the west front left as it was; others, we presume, would say, if a new front be added, make it in the style of the day. As far as mere theory goes, Lord Grimthorpe has the best of the argument. The west front of St. Alban's,—anything worth calling a west front,—had disappeared. It is mere fanaticism to say that the front as it was left was a worthy front to an old abbey which was to be resuscitated as a modern cathedral. In no former age has it been questioned that it was not only a pardonable but a spirited and praiseworthy thing to glorify an ancient building with a new and more imposing façade. It is a kind of enterprise which at different times has called forth the energies and emulation of the best architectural artists of their day. The Milanese have inaugurated a great competition for a new façade to their cathedral: does Canon Venables wish to stop them? The Florentines have just completed a façade to their cathedral: are they also to be denounced? And then as to the question of style, let us once more remind the antiquarian section that architecture is, after all, art, and not mere history. When a new façade is to be added to a great building, which is in a special and marked style, it is a matter of artistic common sense, to our mind, that the addition should be such as to harmonise in style with the rest of the building. This is the principle on which the Florence façade has been designed; not, alas! as well as it might have been, but with the right intention. To add a façade "in the style of the day" merely for the sake of a Quixotic truthfulness, is a want of perception of artistic fitness. To our thinking, for instance, Inigo Jones did a stupid thing (were he three times Inigo Jones) when he tacked a Classic portico to the end of old St. Paul's. The designer of the western towers of Westminster Abbey (whether it were Wren or another) was much more in the right path: he endeavoured at least to make an addition in a style to harmonise with the existing building; not understanding Gothic detail, he did it very badly, but he meant artistically, and he would have been stopped by the S.P.A.B. had they existed then, though the same Society now admire the towers very much because they have been there a couple of centuries. Of course, an architect of genius would be able to design a Gothic front sufficiently in harmony with the ancient style, while giving some original feeling of his own to it. This was the attempt at Santa Maria del Fiore; and this, if fortune favours us with a new genius, is what may yet be accomplished at Milan. We have had too little attempt at this in England. Scott, at St. Alban's, would have built a good imitation of ancient Gothic; Lord Grimthorpe has made a bad one; but we do not hold that this is from any mistake of principle, but from defect of knowledge and taste. Canon Venables is most unfortunate in his reference to the screen masking the end of the aisles at St. Alban's; in condemning which, as his opponent points out, he condemns several of the finest Gothic façades in existence, and finds fault with the only means by which dignity can be given to the façade of a large three-aisled church, in the absence of western towers. In all this we hold that Lord Grimthorpe is perfectly right in theory; and very likely he thinks his façade very fine. Unfortunately, there it is to tell its own tale, and everybody who knows what good architectural design and detail are, knows that it is coarse, poor, and commonplace. The persons really to blame about it are the legal custodians of St. Alban's, who hold the building in trust for the nation, morally if not legally, and who, instead of going to an architect of known genius and knowledge of Gothic, or advertising a competition, as the Milanese have done, for the finest design that could be procured, have turned the building bodily over to be pulled to pieces and rebuilt by a lawyer, who, whatever his other abilities, is no artist in practice, assisted by an ex-clerk of works who has gained a smattering of Gothic detail. Great buildings are not meant to be playthings for amateur architects,* however logical may be their theories of restoration.

An Old Burial-Ground.—The old burial-ground adjacent to Kent-street, in the Borough, is being converted into an ornamental garden by Lord Brabazon's Association.

* We were amused to notice, in an *Edinburgh Review* article some little time since, on some recent ecclesiastical legislation,—an article obviously (rather too obviously) from the pen of Lord Grimthorpe,—various sarcastic comments on the "amateur lawyers" who were responsible for this legislation. Just so: but amateur architects,—that, of course, is another matter altogether!

THE BERLIN MUSEUM.

THE almost simultaneous appearance of three new official catalogues,* Vases, Casts, and Ancient Sculpture, marks an epoch in the history of the Imperial Museum at Berlin. In the department of Greek archæology, where discovery advances just now with a rapidity that is almost bewildering, there has recently come to every Museum worthy the name a feeling that not only must the whole mass of collected material be reconsidered, and in many cases re-arranged, but also that the basis and results of that reconsideration and arrangement must be presented in catalogue form, for the use of the educated public. In the matter of its vase-collection our own Museum is just passing through such a crisis, the outcome of which we hope shortly to chronicle; in the meanwhile it may not be unprofitable to see how, in its several departments, the Berlin Museum, which we may safely call the model museum of Europe, has gone through the ordeal.

The task will be the more instructive because the new Berlin catalogues are not merely catalogues, they are also, in a sense, confessions of archæological faith; in one instance specially we have a bold and thorough-going attempt at classification,—nowhere do we see that timid dread of self-committal, that shrinking from theory, that restriction to the limits of absolutely demonstrable fact which some have held to be the sacred duty of the cataloguer, but which too often serves but to cloak inertia, ignorance, or professional vanity.

We begin with the catalogue of Greek Vases by Dr. Furtwaengler. No one will say it appears before it was needed. The only existing catalogue of a collection of 4,221 vases was the long superannuated work of Lezevow and Gerhard, which went no further than the additions of 1854. Intent on perfecting their Cast Museum, for which an excellent short catalogue was published years ago, the Museum authorities have been tardy in attending to the needs of the less popular vase collection. However, we need not complain; if we have waited long, we at least are amply rewarded. Dr. Furtwaengler represents the advance guard of his own special department; since 1882, when he was moved from the sculpture department to the Antiquarium, he has had that personal experience, that touch and handle knowledge, which is the first essential, and he adds to this experimental tact, a young vigour of opinion, a certain intellectual "push," if we may so call it, which saves him from absorption in the mere aggregation of detail, and which allows him to get through an accumulation of material which would overwhelm an energy less robust and vital. The short history of the gradual formation of the collection he gives in the preface is in itself a memoir of the archæological progress of the present century. The collection began in 1805, with the purchase of Henin's vases in Paris. They numbered 331 pieces, and had all been found in Lower Italy and Campania. They belonged to what is known as the "Lower Italy" class. They are Italian, not pure Greek work,—large, heavy, elaborate, often vulgar in style,—one wonders they roused the enthusiasm even of the amateur collectors; but we owe them some sort of thanks, for, dethroned as they now are, they at one time formed the beginning, and certainly for long the chief glory of every collection, public or private. This "Lower Italy period," which applies to all collections in common with that of Berlin, lasted till 1830, and in 1830 the collection, numbering 2,000 pieces, was lodged in basement cellars, where, alas! it remained till 1879, when it emerged to its present upper-air condition. But meanwhile it had entered into its second and far more interesting

* 1. Beschreibung des Vasensammlung im Antiquarium von Adolf Furtwaengler. Mit 7 tafeln. 2 Bände. Berlin: W. Spemann. 1885.
2. Die Gipsabgüsse Antiker Bildwerke in Historischen Folge erklärt. Bausteine zur Geschichte, der Griechisch-Romischen Plastik von Carl Friedriche, neu bearbeitet von Paul Wolters. Berlin: W. Spemann. 1885.
3. Verzeichniss der Antiken Sculpturen mit Ausschluss der Pergamenischen Fundstücke, herausgegeben von der General Verwaltung. Berlin: W. Spemann. 1886.

stage. In 1828 the first graves in Etruria were opened, Vulci yielded up its treasures of authentic Greek art hitherto undreamed of, and from 1830 until 1871 it was from Etruria that the principal treasures of the collection were diligently reaped. This "Etruscan" period, so fertile in signed vases, is marked by a great archæological name, that of Gerhard, who became connected with the museum in 1833. One reads with amusement of the opposition he met with when he tried to induce the authorities of the Museum to purchase specimens of archaic pottery. They were not beautiful, he was told. A vase collection was still looked at, from the artist point of view, as a collection of pretty things, of graceful shapes, and elegant designs. Connoisseurs who published vases still touched up the drawing of the designs, adapting them to modern taste. How bravely Gerhard fought the hard battle for science, the splendid collection of black figured vases which, in the teeth of constant opposition, he got together, is the best evidence. In 1871, Dr. Curtius succeeded to the directorship of the Antiquarium, where he still reigns. His period we might call the period of "Greece proper." From the first he set himself to secure not so much the splendid examples (and they are, undoubtedly, the finest) that come to us from Etruscan tombs, but rather such vases as were actually found in Greece proper, and which had on that ground special scientific interest. Alas! many such a vase has been offered to our own Museum, and, for want of funds, has passed to Berlin, where its price was not begrudged.

We have said that Dr. Furtwaengler's catalogue is marked by the frank expression of theory. These theories of classification are expressed in the divisions adopted, but for lack of space are not supported by the grounds on which they are based. He tells us in his preface that his original intention was to preface each section of the book with an introduction expounding the reason of the classification. This part of his work he was obliged reluctantly to forego, but he promises shortly to issue a handbook on Greek vases in which this material, advisedly omitted, will be embodied. He asks that judgment on his method of classification may be reserved till after this publication, and (provided his handbook does not tarry unduly long), the request is a reasonable one. We will, therefore, say only that his system of classification is the one which we believe must ultimately obtain, *i.e.*, a cross classification chronological and local. He adopts four main chronological classes and then subdivides by local factories, not, be it observed, by where the vases are found, but by where they were presumably made. Thus in Class B, black figured, we have of the non-Attic group five local subdivisions, Rhodian, Bœotian, Corinthian, Chalcidian, and unknown (? Italian). When we state that, in all, the classes of vases, as arranged by Dr. Furtwaengler, number thirty-seven, with the characteristics and chief specimens of which every archæologist is bound to be familar, we can see that the history of vase-painting is not the elegant pastime which it has long been accounted.

Second in importance comes undoubtedly the new catalogue of the Cast Museum. The book is practically a new edition, with many alterations and modifications of Friedrich's well-known "Bausteine." The "Bausteine" was published in 1868. It consisted of a catalogue of the casts then in the Berlin Museum, arranged according to the accepted periods of Greek art, and under each number a critical description and commentary on the statue or group described and citation of the literature referred to. The catalogue had thus become incidentally a valuable handbook. Since 1868 there has, of course, been added to the Museum a vast store of new materials, and, with the new material, has come the shifting of many points of view. Dr. Paul Wolters, the new editor, has incorporated all the new material, and, while keeping the general scheme of the book intact, he has rewritten it up to date. One alteration he might well have made by which we think the arrangement would have gained in utility. Dr. Friedrich classed the *archaistic* specimens of sculpture immediately after the genuine "archaic": we think it is a mistake to continue this method. *Archaistic* sculpture taken in its actual chronological place, *i.e.* in the Græco-Roman period, is very instructive, but, taken in connexion with the genuine archaic, it can be to the eye of the student only confusing. Of course the order of the book is not a very serious matter, because the student can, if he pleases, reverse it, but a protest should be entered against any encouragement to a false method. With this exception there is nothing in the whole arrangement that calls for criticism, and the work will be not only invaluable as a guide to the actual museum, but will also be serviceable to the student in other countries and with other museums as a handbook for general reference. A student in the South Kensington Museum of Casts could not do better than supplement the somewhat meagre information of the official catalogue there by constant reference to the new edition of the Bausteine.

Last, we come to the new catalogue of the Greek and Roman originals of the Berlin Museum. This catalogue supersedes one published in 1861 and long since out of print. It is well known that until the discovery of the Pergamene marbles the Berlin museum was not rich in original work. It has been decided,—we think very wisely,—not to incorporate the Pergamene marbles in the present catalogue; to have done so would have involved a delay probably of some years, as new material is still constantly coming in; further, the Pergamene remains form a subject quite distinct in themselves, and may well form the subject of a separate treatise. The most interesting additions to the originals of the museum have been those purchased from the Sabouroff collection. The special value of this collection is that the "provenance" of every object contained in it is strictly known: they were all collected on the spot of discovery, and by M. Sabouroff himself, without the intervention of any dealer. The whole of the collection, the terra-cottas which have gone to St. Petersburg as well as the marbles, bronzes, and vases which remain at Berlin, are in process of publication in a splendid illustrated work by Dr. Furtwaengler, which, on its completion, we shall hope to discuss. But for those who are unable to possess a book so costly the small Berlin catalogue gives a valuable account of all the marbles, some of which are of unique interest. We have had occasion, when the collection was first bought by the museum, to call attention to the most notable sculptures, *e.g.*, the Sparta stele, the Salamis bronze, the Demeter head, but we may notice now that the collection contains many others less remarkable in execution, but of equal interest as to subject,—such is the relief of Pan and the Nymphs (Furtwaengler, xxviii), which it is satisfactory to find side by side with the famous Nani relief: the new addition represents a type prevalent in the fourth century B.C., three nymphs dancing hand in hand are led by Hermes within a cave, in which, to the left, sits Pan aloft on a rock, below him four worshippers approach. in the centre of the cave is a rocky altar, to the right a head of Acheloos. Of similar date, style, and subject is a semicircular relief (Furtwaengler, xxvii.) representing a grotto in the midst of which, on a table, is the bearded and horned head of the river god, Acheloos. Round him, seated and standing, in curious perspective, are seven deities; in the centre Zeus, to his left a youthful Pan, to the right Kore and Agathodaimon, the rest uncertain. For the study of this subject of the worship of Pan, the nymphs, and the river gods, Berlin offers now unequalled material. In conclusion, we may note that this small catalogue (sold for one mark) is a model of arrangement and of index reference. There is an index of subjects, of inscriptions, of "provenance," and a comparative table of the old and new catalogue numbers. We shall look forward with interest to the companion volume on the Pergamene sculptures; possibly the restoration of the Pergamene Acropolis at the Kunstanstelling may hasten its appearance. Since the issue of these three new and admirable catalogues it is more than ever our conviction that Berlin is the place in which every beginner should lay the foundation of his archæological studies.

NOTES.

THE statistics put before the representatives of the British iron trade by Dr. Percy, the President of the Iron and Steel Institute, are not very reassuring, inasmuch as they give us the real reason why this great staple trade continues in such a depressed condition. We have so long accustomed ourselves, not only in iron but in other manufactures, to regard our performances with self-complacence, that we have failed to realise the unpleasant fact that other countries are doing not only as well, but better than ourselves; and that, while we have been hugging ourselves with the notion of insular superiority, our rivals are equalling, if not excelling us, both in quantities and qualities. The figures given to the world by the American Iron and Steel Association speak volumes for the rapidity with which the trade has grown up in that country alone,—an increase during the three years between 1879 and 1882 of 80 per cent. At the present time the American aggregate capacity is estimated at 8,900,000 gross tons of 2,240 lb., showing a capacity of production more than double the actual make of 1885, or nearly 300 per cent. greater than the actual make of 1879. There are many ironmasters in England who can remember the time when nearly the whole of the American demand for iron was supplied by this country; but now the tables are turned, and the Americans are able, not only to supply themselves with every ton that they can use, but also to come into foreign markets and undersell us. In Bessemer steel, this is still more marked, and British steel makers need not flatter themselves that they will ever receive many more orders from the other side of the Atlantic. What America is doing on a large scale to compete with us, Continental States are doing on a smaller one, notably Germany, which, by dint of intense pertinacity and losing no opportunity of adopting every scientific improvement, is frequently able to cut us out, even in our own colonies. Disagreeable as these conclusions are, we need not, however, despair; but we should, masters as well as men, drop all the old-fangled ideas as to the superiority of English resources and English skill, and remember that in those matters all the world is against us.

WE are glad to notice that the Committee on Railway Rates and Railway Administration, as affecting the trade of Liverpool, express themselves satisfied with the way in which the railway companies have responded to their appeals for reduced rates. This body has succeeded in obtaining concessions varying from 10 to 25 per cent. in the charges upon traffic conveyed to and from Liverpool. This must represent a very considerable sum per annum, and the confidence of the Chancellor of the Exchequer in the readiness of the railway companies to meet their customers appears to be justified. At the same time, this may be one of those cases in which the companies have acted from a feeling of necessity, the possibility of the Manchester Ship Canal becoming an established fact having doubtless its influence upon their decisions. Sir W. B. Forwood is chairman of the Liverpool Committee, and he considers that the rates, compared with what they were, are now very moderate. A very different report comes from Manchester, a contemporary being informed that a considerable advance has been made in the rates for carriage of castings from Manchester to London, Birmingham, and other places. The particulars given show that the rates are in some instances to be doubled, and as all recent revisions in railway rates have been in the opposite direction, the rumour is probably either very much exaggerated or altogether unfounded.

THE excavations at Epidaurus are going on vigorously, and have lately reaped a rich reward; no less than fourteen statues have been

found lying close together. Three of them represent Asklepios, and are of finer work than any as yet extant. We shall now be in a position to judge definitely of the accepted type of the god's face and features, and it may be hoped that much light may be thrown on the vexed question of the "Asklepios" of the east frieze of the Parthenon. Another statue represents Athene, and is reported to be of exquisite work. A Pan, a Kybele, and a number of heads, complete the list. The worship of Pan and the Nymphs, it will be remembered, was closely connected with that of Asklepios, the healing powers of nature being always recognised to the full by the Greeks. We can only hope that a book as full and as lucid as the "Asklepieion" of M. Girard, which treats of the Athenian temple, may be written on these no less fascinating discoveries at Epidaurus.

THE Δελτίον τῆς Ἑστίας (No. 501) further reports the discovery, a little later, during the same excavations, of three new statues, all of considerable interest. The first is a life-size figure of the type known as the Venus Genetrix, or, if we prefer Greek nomenclature, the Aphrodite Geneteira. The best known replica is that in the Louvre. Aphrodite is represented, it will be remembered, in very closely-clinging drapery, and the conjecture has been hazarded that this type may be the representation of the draped Aphrodite made by Praxiteles for the people of Cos, the counterpart, as it were, of the far more famous nude Aphrodite made for Cnidos. The new statue seems to be of Hellenistic date. The second statue is a Hygieia life-size, but, unhappily, without the head. From the drapery it is judged to be of the finest period. The third statue is an Athene, a little less than life-size, also headless. Nothing is reported of the style, so we may presume that it is far inferior to the Athene mentioned above.

THE efforts, which have been for so long before the world, to turn Paris into a great seaport, appear to have made more rapid progress of late, and to be assuming some degree of crystallisation. A formal demand has been placed in the hands of the Minister of Public Works for the concession to a Society of a canal between Rouen and Paris, the said canal to be formed in the bed of the Seine, and to be sufficiently deep to allow vessels drawing 6 mètres of water to approach the metropolis. The anticipated works do not seem to be very difficult or extensive, the estimate of the time required for the completion of the whole being only three years. No State subvention or promotion is asked for, but only the enjoyment by the company of those parts of the river bed which would be drained or reclaimed, and also that the State ground on which the works may have to be carried out may be given free of cost. A charge of 3 francs per ton will be made on every vessel using the canal between Rouen and Paris, and smaller rates for intermediate distances. Although the scheme does not involve any enormous expense of construction or any interference with existing manufacturing districts, as in the case of the Manchester Ship Canal, it is probable that the risk is quite as much as the future results would warrant; for, under any circumstances, it is not likely that large sea-going vessels will ascend the river higher than Rouen, and the class of business, therefore, between that port and Paris would seldom exceed that of a coasting trade. Although this particular undertaking seems to be of a private nature and origin, we have no doubt that it received a considerable impetus from the proposals made by M. Freycinet several years ago, to vastly increase the waterways of France.

THE French School at Athens have brought to a close their excavations on the site of the Temple of Apollo Ptoos at Akraiphnion,—the results of their work we have from time to time chronicled. Their concluding efforts laid bare a remarkable aqueduct structure. The walls of the reservoir are still intact; it i divided into seven compartments, in one of which water still remains to the height of eight centimètres. Near the building the heads of three statues were found,—one of marble, two of tufa.

THE excavations in the Acropolis between the Erechtheion and the Propylæa still continue to yield fresh treasures of archaic art. A late and very valuable find is the head of a bearded man in bronze, of distinctly archaic style. The head is somewhat over life size, and in type is reported to approach near to the Ægina marbles. If it can boast of the same peculiar and so far unique purity it is indeed a treasure. Up to the present time no bronze head of equal size has been found in Greece proper; the famous Olympia athlete head must now retire to the second place. Further, the discovery of a large quantity of terra-cottas is reported, some bearing artists' signatures, but of these no further particulars are given.

THE Archæological Society at Athens has just entered on its second year's work at Oropos, on the site of the oracle of Amphiaraos. The theatre was quickly laid bare. A portion of the seats have been uncovered, and one of them has inscribed on it the name of a priest of Amphiaraos, Nikon. A beautiful stele has also been found, and its interest is greatly enhanced by the fact that it bears the name of an Athenian sculptor, Strombychos, hitherto unknown to us.

WE regret to hear that the Liverpool Corporation have refused to allow the second panel by Mr. Stirling Lee, designed for St. George's Hall, to be fixed, and it is understood that litigation is likely to arise out of the case, Mr. Lee being advised that the Corporation have not acted according to the terms of his contract with them in the manner in which they have stopped the work. From a previous very absurd discussion in the Council, which we adverted to at the time, we gather that one objection to fixing the panel is that it contains a nude figure, but we imagine that the real objection amounts to a kind of general "don't-care" feeling on the part of a majority of the Council, who do not want sculpture, and object to pay for it. An objection has also been raised against inserting marble in the walls; and there is no doubt that Elmes contemplated the actual stone, left in rough-tooled raised panels, being carved in bas relief; but the marble would make much better and more enduring work. Sir Jas. Picton, Mr. Samuelson, and Mr. Rathbone all supported the continuance of the work at the Council meeting last week, but they and their supporters were largely out-voted. It is much to be regretted that the present municipal authorities should be so indifferent to the completion of a world-famous building, which seems now to be regarded with more interest anywhere than in the town in which it was erected.

MR. A. B. MARSTON, the editor of the *Fishing Gazette*, writes to draw our attention to the fact that the Dean of Winchester has promised to find a niche for a statue of Izaak Walton in the cathedral, "if anglers will provide the statue,"—that is, we presume, the funds. The "gentle craft" has its followers in all professions, and no doubt many of our readers will feel an interest in the idea of a monument to the guide, philosopher, and friend of anglers. If so, they are invited to express their interest in a practical form in the way of subscriptions to the "Izaak Walton Statue Fund," which Mr. Marston will be happy to receive and acknowledge in the *Fishing Gazette*. Some of our architect and artist friends, we may hint, will probably like to know what sculptor is to execute the statue, before they make up their minds to subscribe to it.

Southampton.—The new Art Society of this town will hold its first exhibition at the Philharmonic Hall, from the 20th to the 22nd of October, under the Presidency of Major-General Lacy. Mr. J. C. Churcher is the Honorary Secretary.

EXPERIMENTS ON COLONIAL WOODS.

SINCE the opening of the Colonial and Indian Exhibition there have been held at stated intervals a number of conferences on subjects connected with the objects the Exhibition has been established to further. These gatherings have not been invariably a success, so far at least as attracting an audience is concerned. Last week, however, quite a new element was introduced into the proceedings, and that of a most profitable and agreeable nature. The subject of the conference was the timbers of the Colonies, and the uses to which they could be put, and the scene of operations was shifted from the unattractive theatre at South Kensington to the trial room at Messrs. Allan Ransome & Co.'s works at King's-road, Chelsea. The great advantage of holding the meeting at these works was that a practical illustration could be given of the uses to which the various woods shown in the different courts at South Kensington might be put.

What is known as the trial-shop at Messrs. Ransome's works is a large building, fitted up with the various wood-working machine tools for the manufacture of which this firm is well known. These are kept in working order, in order to give this firm's customers an opportunity of practically judging of the uses of the machines. This afforded an excellent field for the pursuit of the work in hand. The various woods were planed, turned, or otherwise shaped, mouldings being cut, sleepers recessed and bored, and a vast number of other operations, familiar to the majority of our readers, were performed.

Canada contributed four specimens, the most important of which was undoubtedly the Douglas fir (*Pseudotsuga Douglasii*). It is only lately that the district in which this noble tree is found has been opened up. It grows all through the Rocky Mountains down to the Pacific coast, and reaches 5 degrees north. Professor Macoum has stated that he found it from latitude 49 to latitude 55. The trees produce a great quantity of timber, and one has been mentioned by Professor Macoum (who, it may be remarked, is the specialist in the botany of timber trees attached to the Canadian Geological and Natural History Commission) which, out of a length of 90 ft. of trunk only tapered 6 in. The opening of the Canadian and Pacific Railway should do much to facilitate the introduction of this wood, which may well take the place of the Canadian yellow pine, should the supply of that timber show signs of failing. A feature of special interest to engineers, which has been brought forward by the experiments Messrs. Ransome have been engaged upon with these colonial woods, is that the Douglas fir swells very little when soaked in water, and is, therefore, especially suitable for pattern-makers' uses. This wood was made up before the visitors into a great variety of forms, and, to all appearance, left nothing to be desired in the way of working under the tool.

The Black or Swamp Ash (*Fraxinus sambucifolia*) was another wood that attracted a good deal of attention. The wood is suitable for building purposes, joiners' work, cask-making, &c. The swamps all through Quebec and Northern Ontario are filled with this tree, and the wood is so plentiful that it is used for burning, splitting into rails, and other common purposes. The Douglas fir and black ash could, we are told, be delivered into the English market at 5*l.* per ton.

The remaining Canadian woods experimented upon were the White Fir (*Picea Englmani*) and the Bitternut or Swamp Hickory (*Carya amara*). The former was worked up into a variety of forms, and is said to be of superior quality to Archangel pine,—a fact which may be true, but requires further verification. The hickory extends from Halifax to the western port of Victoria on the Pacific coast, and is abundantly plentiful. Axe-handles and other forms were being made from it. Its other uses will, perhaps, be too obvious to our readers to require enumerating.

The Australasian colonies contributed a large number of specimens, the various "gums" or Eucalypti taking a prominent place. It is difficult to know what to say about these woods. That there is a plentiful supply of Eucalyptus trees in Australia is undoubted, and if we may believe the reports of our Australian friends (which, of course, we do), there appear to be few hard woods in the place of which the

Eucalypti cannot be used. Some are equal to teak for submarine work, and withstand the *teredo navalis*; others are tough and elastic; whilst another kind, though short and brittle, is admirably suited for resisting crushing strains. The beauty of many species can be placed beyond doubt by a visit to South Kensington, and, indeed, it would be difficult to name any quality, except perhaps that of lightness, which is not present in Eucalyptus wood in some or one of its many forms. On the other hand, it may be asked, how so many virtues have come to be hidden under the bushel of local consumption? And no doubt the answer would be found in the problem of transit.

New South Wales had sent several samples, but, unfortunately, the specimens were so small that they were fit for little more than small turnings. The wood Messrs. Ransome had selected as being the most economically important was the Ironbark. This wood is said to be used for carriage building, spokes of wheels, piles, and railway sleepers. The wood appeared to be very hard, and is accounted durable. The Mountain Ash (*Euclayptus Sieberiana*) is also used for carriage building, and for wheelwrights' and coopers' work.

The Victorian woods were chiefly represented by the Blackwood (*Acacia melanoxylon*), which is used in the colonies for all kinds of cabinet-work, carriage-building, &c., and also for making casks. The Blue Gum (*Eucalyptus globulus*) and Red Gum (*Eucalyptus rostrata*) are very important timber trees in Victoria, and there appear to be few ordinary purposes to which their wood cannot be put, as we find the former mentioned as being used for beams, joists, railway sleepers, piers, and bridges; whilst the red gum is made into veneers, furniture, railway sleepers, &c. At the conference these woods were formed into sleepers, one of Messrs. Ransome's automatic chair seating and boring machines being used for the purpose. So far as working was concerned, there seemed nothing to be desired.

The leading wood contributed by Western Australia was the Jarrah (*Eucalyptus marginata*), a log of which forms so conspicuous a feature in the court of this colony at the Exhibition. It is used for joiners' work, railway sleepers, furniture, cabinet work, and piles. The wood is dense and very heavy. It takes a fine polish. At the trials it was worked up into a great number of forms, and appeared to pass through all the machines satisfactorily, although naturally not at a very high speed. The Kurri wood (*Eucalyptus diversicolor*) is another heavy close wood. It is said to be suitable for joiners' work, railway sleepers, furniture, &c. Messrs. Ransome state that it is liable to centre shakes, but if the heart be taken out when first cut, the parts between the heart and sap afford excellent material.

Amongst the samples of New Zealand wood submitted for experiment, the Kauri Pine (*Dammara Australis*) was pronounced the finest. It is very sound, and can be obtained in large pieces, and works, Messrs. Ransome say, with the greatest facility. It warps very little, and cracks hardly at all. The only thing against it here appears to be that it is grown on the other side of the world, where it is used for a very large variety of purposes: such as building, furniture-making, slack-barrels, pattern-making, and, in fact, almost all ordinary work. Three other samples of pines were shown, but the Kauri is undoubtedly the most valuable of all.

From the Cape, wood that attracted most attention was the upright yellow wood (*Knysna*). This was made up into a large variety of forms, chiefly in planing and moulding machines, and appeared to work excellently. It is said to be very plentiful, and is suitable for joiners' work and general purposes. Sneeze wood (*Pterozylon utile*) is used for sleepers, telegraph-poles, wagon work, &c. It is also well adapted for submarine construction, not being attacked by the teredo. Stink wood (*Oreodaphne Bullata*) is well adapted for furniture-making and cabinet work. This wood quite deserves its uncompromising name; but the disgusting odour that it emits when first cut disappears after a time.

The woods of North Borneo received a good deal of attention. The Billian possesses this curious property. When first cut it is almost white, but becomes as black as ebony upon exposure. It is close grained and sinks in salt water. There is any amount of this wood along the coast of Borneo. Some other woods were also experimented with, but those we have mentioned appeared to be the leading examples. A feature that was remarked throughout the proceedings was the facility with which the specimens worked under the tools. Of course, there are two factors necessary to gain this end, viz., good wood and good tools. It may be that the excellence of Messrs. Ransome's machines gave these colonial woods an advantage they would not always possess.

CHANGES AT SCOTLAND YARD.

It has been officially announced that the head-quarters of the Metropolitan Police are about to be removed from Scotland-yard into more commodious offices to be erected for them over the site of the prematurely deceased National Opera House, Victoria Embankment.

The name of Scotland-yard is not only familiar enough to our generation as associated with the police force, but should recall certain incidents of an important, though almost forgotten, chapter in the making of Great Britain. Further, as we shall show, it was intimately connected with the former office of Surveyor of His Majesty's Works, whose modern representative is still quartered in Whitehall-place, hard by. The site itself, once enclosed within a great wall, was formerly known as "Scotland." According to tradition, Kenneth III., king of Scots, was one of the eight vassal sovereigns who rowed Eadgar's state barge along the river Dee. The ground in question is commonly said to have been bestowed upon Kenneth by Eadgar whereon to build a residence for himself and successors upon their visits to London for the paying of homage to the English Crown. It is worth while to consider in respect of what territory this fealty was expected. For it cannot be too clearly understood that in those days much of what we now know as Scotland was in no manner Scottish: some of England had not become English. The Picts of the present north-eastern Highlands were supplanted by King Fergus I. and his bands from Ireland,—the original Scotia,—who in A.D. 330 invaded the north-western coasts of Britain.

By the tenth century we find the King of Scots, himself a Kelt, reigning freely north of the Firths of Forth and Clyde over a Keltic, that is, an Irish people, who speak in the older Ghaelic tongue. But the south-western part of modern Scotland, together with portion of what is now north-western England, constituted the kingdom of the Strathclyde Welsh; their territory represented by Cumberland and Galloway. Here were ruling sovereigns of the Scots royal house, it is true; nevertheless this distinct State was as independent of the King of Scotland as of the King of Wessex. The Lothian of our day formed parcel of Northumberland, stretching from the Humber to the Forth; a Teutonic country inhabited by an Anglian race using, as they still do use, the Northumbrian dialect of English Northumberland, its people being the Sassenach or Saxons, who had owned Ecgberht's supremacy and renewed their submission to Ælfred. An English claim to dominion in Scotland arose from the submission which the Scots and Strathclyde Welsh yielded in the year 934 to Eadward the Elder, son to Ælfred, whose own kingdom reached northwards as far as the Humber. With their subjects' consent the princes north of that river "chose Eadward to father and to lord." With the English kingdom Æthelstan, son of Eadward, incorporated Northumberland, including Lothian. Eadmund, Eadward's son, having conquered Strathclyde upon its revolt, granted it to Malcolm I. (944–953), father to Kenneth III. (970–994), to hold in tenure of military service by land and sea. Under either Eadgar, son of Eadmund, or Cnut the Dane, all Lothian was ceded to the Scots king, who, in Eadred's time, had acquired the great Northumbrian Bretwalda's border fortress of Eadwinesburgh (Edinburgh). Thus, it happened that Scotland proper, Lothian, and Strathclyde became associated under one sovereign, the Emperor, *ad hoc*, of Britain. A tie of purely personal commendation, to use the befitting term, connected Scotland proper with the English crown. Strathclyde formed a territorial fief: Lothian was an integral piece of England in respect whereof the King of Scotland was an English earl. Professor Freeman points out that no Scotch writer repudiates the once vassalage of part of Strathclyde,—namely, Cumberland;—nay, it is the rather insisted upon as though thereby to weaken any pretensions to lordship over Scotland itself. In course of years the English Lothian becomes the actual kingdom of Scotland. Former distinctions melt away; and whilst the Scots kings held both royalties and private estates across the border of later England, for which homage was as legitimately due as from any English noble, it depended in effect upon the character of the Emperor of Britain whether homage for Scotland proper should be rigorously demanded or willingly rendered. This complex question came for settlement before that greatest of our sovereigns, who on his tombstone in St. Eadward's chapel, West Minster, is styled "Scottorum Malleus," "when a crowd of competitors for the Scottish Crown were eager to lay their contending claims at his feet." Appealed to as Sovereign Lord and Emperor of Britain by Robert Bruce, anterior to the conference at Norham (1291), King Edward I. received the collected claims, by first securing that his own claim to superiority should be fully admitted. "Edward put forth his claim, a good and honest claim, urged in good faith." So exercising his sceptre's pristine right he nominated John of Balliol to reign as his vassal, setting aside a tempting proposal by Bruce and Hastings for a division of the realm. But with the varying victories of Dunbar (1296), Falkirk (1298), and Stirling (1297 and 1304),—contests in which either side had right to engage,—the old relations finished, and at Bannockburn, ten years later, Scotland won her independence for ever.*

That the Kings of Scotland were for some period considered to be members of our Parliament appears from certain records, once kept in the Tower, of the issue of writs summoning them to Westminster. Pinkerton's "Iconographia Scotica" contains an engraving,—said to be copied from a limning in the College of Arms,—which delineates Edward I. seated in Parliament with King Alexander, his brother-in-law, at his right hand, and at his left Llewellyn ap Griffith, Prince of Wales. Yet no King of Scotland after William the Lion is believed to have occupied the royal palace in Scotland-yard; and in the reign of Henry II. it reverted into that sovereign's hands. The last of the Scottish royal line to occupy it was Margaret Tudor, widow to King James IV., who after her first husband's death on Flodden Field came to London. Here she was splendidly entertained by her brother, Henry VIII., upon his reconcilement to her union with the Earl of Angus. James VI., as was only natural under the circumstances, did not press his privilege to inhabit the palace, which, with his succession to the English crown, was finally deserted as a royal residence. The liberties, however, extending from Downing-street to Northumberland-street, Strand, retained their ancient immunities, as appertaining to a royal palace, of freedom from arrest and other legal processes for debt. In so much so that in later years nearly three-fourths of its inhabitants were insolvent debtors, taking refuge within the Verge of Court, as the jurisdiction of Board of Green Cloth was styled. Scotland-yard would not seem to have fallen within purview of the Statute 8 and 9 William III., c. 27, for the suppression of pretended privileged places. It continued, indeed, to afford sanctuary to debtors, under the Board's protection, until shortly before the No Popery riots of 1780.

And Scotland-yard could boast of other famous inhabitants. Milton lived here when Latin secretary to Cromwell; and here he lost his infant son, child by his first wife, Mary Powell. A book of orders of the State Council during the usurpation, contains numerous entries affecting Milton's secretaryship. One runs, under date, November 19th, 1649,—"Ordered that Mr. Milton shall have the lodgings that were in the hands of Sir John Hippesley, in Whitehall, for his accommodation, as being secretary to Councell for Forreigne Languages." He removed hence to Petty France in June, 1651. Lord Herbert of Cherbury, Inigo Jones (who, with his master mason,—there were no "sculptors" in those days,—Nicholas Stone, buried his money here during the Commonwealth), Denham, Beau

* We follow Professor Freeman in the main. His arguments may be more closely pursued in his History of the Norman Conquest, vol. i., and Appendix; and in his essay upon the Relation between the Crowns of England and Scotland.—*Fortnightly Review*, June, 1867.

Sketches from the Wakefield Ecclesiastical Exhibition.—Fig. 1.

Fielding, Vanbrugh, and Wren all lived within the boundary. It was in front of Scotland-yard that Lord Herbert, as he relates in his Autobiography, defended himself from the attack of Sir John Ayres and his hired ruffians. The *causa teterrima belli* was the circumstance that Lady Ayres would wear a miniature likeness of Lord Herbert. In Scotland-yard, close to the after site of Little Fife House, Sir John Vanbrugh built for himself, from materials of Whitehall Palace, the diminutive and fantastic Gothico-Græco house, likened by Swift to a goose-pie amidst the rubbish. The subject of Dr. Evans's epitaph, which will endure as long as the buildings it ridicules, was author, architect, and—Whig. Hence the animosity with which the other party assailed him. When he was appointed Clarencieux King-at-Arms, Swift said that he might now build houses. Sir Joshua Reynolds pays warm tribute to Vanbrugh's originality of invention. After defending him from the wits, he concludes, "His fate was that of the great Perrault. Both were objects of the petulant sarcasms of factious men of letters, and both have left some of the fairest monuments which to this day decorate their several countries, the façade of the Louvre, Blenheim, and Castle Howard." Vanbrugh, though, unlike to Perrault, was never assailed as a writer, the merits of his plays being universally acknowledged. For the best account of Beau Fielding we should turn to Steele's more gentle satire. Despite its tone of ludicrous banter he gives us, in his History of Orlando the Fair (*The Tatler*, Nos. 50, 51), a fair picture of a man whom, whilst not deficient in parts, inordinate vanity drives to the confines of insanity. Endowed with a person of singular grace and beauty, he could, as Steele says, refute ridicule by merely moving. Swift, on the other hand, holds him up to contempt in his "Great and Mean Figures." An advertisement inserted in Salisbury's *Flying Post* for October 27th, 1696, is illustrative of the times. Announcing the robbery of two gentlemen by six highwaymen at Kentish Town on the 14th *idem*, it requests that "at any rate the cane, valuable as having been the gift of a friend," may be sent to Wells's Coffee-house in Scotland-yard. The dwelling here in turn of Inigo Jones, of Sir John Denham, who, Wood tells us, got 7,000*l.* by his appointment, and of Wren, is due to the fact that the Crown Surveyor had an official residence in Scotland-yard. Pristine associations with Scotland were curiously revived about a century since. Under date, Fife House, February 4th, 1803, Lord Fife, writes to the Society of Arts, "Fife House, Whitehall, is a Crown lease. I have made two different embankments, which, with the buildings, have cost me many thousand pounds. The first embankment was made about five years after my entry on the lease, and the other twelve years after; they were made at a great expense. All the trees and shrubs planted in these embankments, as also the stones, were brought from my estates in Scotland. . . . . Some of the elms planted in the first embankment measure 5 ft. 4 in. girth and above 50 ft. in height." Lord Fife was a celebrated arboriculturist, and had received the Society's gold medal for his plantations, &c., in North Britain. The last vestiges of his house, garden, and embankments by Middle Scotland-yard have given way to the new Whitehall Court and National Liberal Club.*

Though the little that remained of the Scottish palace had long disappeared, the site maintained its connexion with the Crown in the shape of the palace court, which was established by letters patent of 1664. The judges and officers of the Marshalsea Court of the Queen's House were the same as in this. According to a "Treatise on the Police of the Metropolis," by a Magistrate [P. Colquhoun], London, 1796, the latter was a Court of Record, or Court of the Royal Palace, with jurisdiction twelve milds around Whitehall, excluding the City, for actions of debts, damages, trespasses, &c., and subject to be removed to a higher court when exceeding 5*l.* It was taken to Scotland-yard in the year 1801, and was finally abolished on the 31st of December, 1849. By the courtesy of the Receiver of the Metropolitan Police District, the writer is enabled to state that the head-quarters of that police were established in Scotland-yard at the formation of the force (under Sir Robert Peel's Act) in 1829; but that no remains of the old buildings have been found beneath any of the offices at present used for police purposes.†

Bradford Historical and Antiquarian Society.—The annual meeting of the above society was held on Friday, the 8th inst., at the Alexandra Hotel, Horton-road, Bradford. The chair was taken by the President, Mr. Councillor Empsall, who called upon the Corresponding Secretary, Mr. J. A. Clapham, to read the annual report, which referred to the flourishing condition of the society. During the session seven papers had been given upon a variety of archæological subjects, and seven interesting excursions had been made. In the coming session papers had been promised by Mr. J. P. Pritchett, on "The Great Mediæval House of Neville"; by Mr. T. T. Empsall, on "Bradford in the Seventeenth Century"; by Mr. Wm. Cudworth, on "Old Bradford Lawyers—The Bentley Family"; by Mr. Wm. Scruton, on "Early Days of the Drama in Bradford"; by Mr. John Lister, M.A., on "Gleanings from Old Halifax Life"; by Mr. Wm. Glossop, on "The Electoral History of Bradford"; and by Mons. Federer, on "Rev. Dr. Scoresby." Excursions were proposed to the two Riddlesden Halls, near Keighley, Temple Newsom, Selby Abbey and Wressle Castle, Heysham Church, Castle, and Old Hall; Settle for Folly Hall, Giggleswick Church, and the Flowing and Ebbing Well; and on Bank Holiday (August) to Coxwold, Newborough Hall, and Byland Abbey. The treasurer, Mr. Wm. Glossop, gave the financial statement, showing a balance in hand of 27*l.* 13s. 10d., besides hundreds of copies of the "Bradford Antiquary," the journal published by the society. The officers and council were elected.

* *Vide* the *Builder*, May 9th, 1885; December 5th, 1885; January 2nd, 1886; *et ante*.

† In his "Sketches by Boz," Charles Dickens recounts, *more suo*, the changes he had known to come over Scotland-yard, and Cruikshank drew for it the group of local coal-heavers carousing.

THE ECCLESIASTICAL ART EXHIBITION AT WAKEFIELD.

THE LOAN COLLECTION.

Among the interesting productions of ancient and Mediæval art in this collection, some of those from the cabinets of Mr. and Mrs. Riley were the most interesting and most beautiful. The Russian silver icon, said to have been in the possession of the Stuarts, which we illustrate (fig. 1), especially, is a fine example of early Christian art. The Latin texts upon the nimbuses do not appear to be original, and are scratched on the silver comparatively roughly. In the same case with this, and also lent by Mr. Riley, were two beautiful ivory diptychs, about 9in. and 4in. high respectively, one, certainly, and probably both, of French seventeenth-century workmanship. Each panel of the larger of these is divided into two heights, containing a crucifixion in the middle, with a conventional St. Jerome and the lion beneath, and at the sides female saints, and half-figures of male saints beneath. The drapery and air are tinted, and the whole is enclosed in a mongrel architectural framework of foliated arches, supported on quasi Corinthian columns. The smaller ivory contains in a plain framework a representation of the death of a saint, who lies upon a bed, at the head of which stands a monk, while St. Michael descends from the clouds, and with his sword drives away the devils that are whispering in the ear of the dying man, and playing round the room. In the side panels are angels, and a pilgrim with his cockle and staff.

Close to these were shown a small enamelled copper triptych, not much more than 1½ in. high, with representations of our Lord enthroned, and saints; and an ivory reliquary casket, covered with architectural ornament of a Romanesque type; and a series of heads, with much character in the faces.

In the adjoining case were exhibited a small collection of the "Baptismal Shells" brought by pilgrims from Palestine; pieces of mother-o'-pearl, carved with more or less skill to represent subjects from sacred history; and others saints and their acts. Also some powder-horns, a German one with a hunting scene; and one from Assissi, which justified its appearance in an exhibition of ecclesiastical art by bearing a rough representation of the temptation of Eve. A case on the other side of the room contained a miscellaneous collection of antiquities, among which were coins, bronze utensils, a little red Roman pottery, bones, bronze armlets and keys, fibulæ, statuettes, a Grecian terra-cotta lamp, and a marble slab engraved in Greek, with the words "Helpful one, farewell,"—"Farewell to thee too,"—said to be from the catacombs of Rome. Among these objects, a bronze bib-cock and spanner arrested attention, in form not unlike those in use at this day, but slighter, and with a vent to allow the air to enter.

In the large wall-case in this room were exhibited the heavy silver-gilt flagons and communion plate, belonging to the parish church of Wakefield, the great weight and consequent value of which are duly appreciated by the inhabitants generally. They are entirely without ornament, and do not pretend to any grace of form.

On a shelf above these were a few interesting old silver chalices and patens; we illustrate three of the chalices which appeared exceptionally good. One of them, a very elegant cup on a slender stem, bears the inscription, "A maiden's gifte, Margarite" (fig. 3), and appears to be of seventeenth-century workmanship. Another is a remarkable, nearly straight-sided cup with a cover (fig. 4), of rude workmanship, and bearing hall marks showing it to have been made at York. The third is also peculiar in shape, being very thick and stunted (fig. 2); all are small compared with most modern cups of the kind, and looked quite diminutive beside the gigantic Wakefield flagons. Beside these were other old chalices almost as interesting, several fine modern ones, and a copy in electro of a very ancient specimen, which reminded one of the Chinaman's dinner service in which all the plates were cracked because his copy had been so. In this cup the dents in the original were made to re-appear. Other objects in the case were a few patens and alms-dishes, not very remarkable, and a couple of pretty little Italian silver lamps. On a lower shelf were a small wooden reliquary cross, inlaid with mother-o'-pearl, engraved with a figure to form a crucifix, the drawing very stiff and conventional. Also a small bronze enamelled crucifix, of Russian workmanship, and a small china censor with bronze mountings, also Russian. A bronze sanctus bell engraved with rural scenes, and with a good deal of raised ornament, and a Roman lecythos, with a handle bearing a female head, were the other objects which we chiefly noted in this case.

Fig. 2.

Fig. 3.

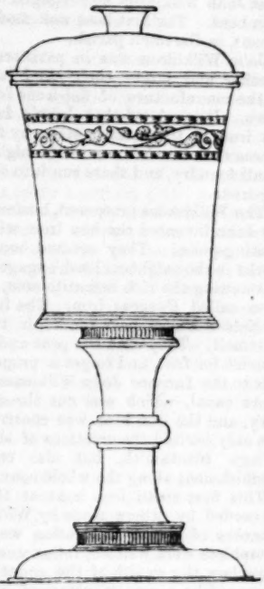


Fig. 4.

Fig. 5.

In the adjoining room there was a large wall case of miscellaneous antiquities, among which two broken wooden figures from crucifixes and a couple of alabaster tablets representing the adoration of the magi and the presentation in the temple, seemed to have the most connexion with ecclesiastical art. In the table case in this room was to be seen a small marble head, said to be from the temple of Diana at Ephesus, and to represent that goddess herself, and standing on the table were some heavy old pewter flagons and a paten, once used as sacramental plate.

Though the exhibition was rich in embroidery, there was remarkably little that was old, a French Renaissance white chasuble of no very great artistic merit, and an Italian white frontal of very late workmanship, which had been remounted and restored, representing the greater portion of this class of work, if we except the chasuble exhibited by the East Grinstead School of Embroidery, which we mentioned last week, and a small piece of the appliqué on which we illustrate here (fig. 5).

Besides the exhibits we have particularly noticed there were large numbers of drawings, photographs, and engravings of ecclesiastical architecture, and church fittings and furniture, and some architectural designs chiefly for the decoration and fitting up of churches. There were also some painted panels for a reredos for St. Mary Magdalen's, Bradford, which, though well drawn, seemed rather too strong in colour, unless the church is a very dark one. On the walls also were a number of rubbings of brasses, some of them apparently of great interest, and we were told that there were many others for which space could not be found; unfortunately the rooms were so dark that we could not properly see many which were not very closely rubbed.

The books and missals exhibited were chiefly interesting for other than their artistic merits, and so were some doors of wood and gilt ironwork "from the bookcase of Archbishop Laud." So also, we must suppose, were a fragment of a Purbeck marble column and some other of the numerous exhibits which we have not space to mention.

THE LION IN HERALDRY.

The lion has always been regarded as the embodiment of courage and generosity, the type of power and dominion, and from the earliest records of history men have assumed to themselves leonine virtues by adopting the monarch of the brute creation as their standard. The Lion of the tribe of Judah will occur to many of our readers in illustration of this, and in the dawn of heraldry no other animal was thought worthy of being represented on the warrior's shield, and prior to the thirteenth century hardly any device but this one existed as an armorial bearing.

The ingenuity of the heralds was greatly exercised to keep pace with the demand for so many different coats of this nature, and hence we have the lion depicted in a variety of attitudes, as rampant, salient, combattant, passant, sejant, couchant, dormant, and so forth, and even as coward, representing him as running away with tail between his legs, and showing every sign of terror.

But in time all these different postures were exhausted, and then people began to adopt parts of lions as bearings, such as paws, legs (or jambs), heads, and even tails; and then strange combinations were sought for, and the effects were half-fish and half-lion monstrosities, and sometimes the king of the forest appears with two tails, three bodies, or even as a demi-lion. Proud as we may be of our own "lions of England" in the Royal coat and of the wide dominion under their banner, we must not forget that each one reminds us of a territory now lost to us,—the first, Normandy; the second, Maine; and the third, Aquitaine.

Shields of arms have been assumed for all our monarchs since the Conquest, but not until the reign of Richard I. have we any evidence to show, and then we get the best of all evidence in this monarch's great seal, and thus for seven centuries have England's quarterings remained unaltered, with the three lions passant guardant, as thereon represented.

To most things there is a comic side, and nothing funnier in heraldry was ever perpetrated than the spectacle of a golden lion sitting on a chair, and holding a battle-axe of silver; and such were the arms attributed to Alexander the Great by the quaint imagination of Gerard Leigh.

When James I. ascended the throne of England, a battle royal was fought between the heralds north and south of the Tweed on behalf of their respective lions, which ended in what is commonly called as a draw by the Scotch coat maintaining the first place in the shield on its own ground and the English one a like position when the border was crossed for English territory, thus reversing the quarterings for each country. Sir William Segar produced a learned treatise on spurious heraldry on this occasion.

Our Welsh neighbours show in their national shield four lions passant guardant counterchanged (the shield itself being quarterly gules and or) for South Wales, and for North Wales "three lions passant guardant in pale gules, their tails passed between their hind legs and reflexed over their backs" on a white shield. It is to be regretted that these Welsh lions have never been incorporated in our Royal arms, and taken their proper position amongst their English and Scotch brethren.

Planché is of opinion that William, Earl of Gloucester, was the earliest bearer of the lion as an armorial device. He died in 1182, and his seal comes down to us with a fine representation of the imperial beast.

We may just add that however grotesque and far-fetched was the early representation of the lion in heraldry, its chief attribute of strength and litheness was most faithfully presented, and whether it was shortened or lengthened to fit the shield, this characteristic was ever conspicuous and unmistakable.

John Lion was a Chancellor of Scotland in the thirteenth century and in high favour with King Robert, whose daughter Elizabeth he was allowed to marry, and his descendants in token of this royal alliance assumed the Scotch shield, but the field black for a difference,—a most historic and interesting coat.

It is presumed that the Scottish lion was derived from the arms of the old Earls of Northumberland and Huntingdon, from whom some of the Scotch kings were descended, and that the double tressure with the fleur-de-lis by which it is surrounded records a truce formed with Charlemagne, and means that France undertook to protect Scotland from her enemies.

The winged lion of Venice forms a most picturesque heraldic bearing, with crown on head, surrounded by a nimbus of gold and holding in his dexter paw a sword with the sinister one placed upon an open book.

Our Welsh neighbours are well known for their love of ancient arms and lineages, and Matthew Carter records that a lion "passant guardant gules" was the coat armour of Roderick the Great, Prince of Wales in the year 843! "By which account," says this quaint chronicler, "coat-armour hath gained a great antiquity."

The lion dismembered has the tail, head, and paws cut off, but placed so near to their natural positions that the outline of the animal remains indicated. The Maitlands bear the Scotch shield with this difference, probably as a grant of services rendered to the Throne.

When more than three lions are borne upon a shield they are technically known as lioncels, and invariably represented rampant.

William Longspée (or long sword), Earl of Salisbury, who died early in the thirteenth century, bore six lioncels on a field azure. Another ancient example and a very fine one is the shield of De Bohun, Earl of Hereford:—"Azure, a bend argent, cotised between six lioncels or."

The lion first appears as a royal crest upon the great seal of Edward III., but standing on a helmet instead of a crown, as it now appears.

As a royal badge the white lion of March was a favourite one with Edward IV.

Supporters are said to have been introduced by Edward III., to whom are assigned a lion and falcon for that purpose; but the evidence is weak, and we have no authority worth naming till the reign of Henry VI., who assumed two antelopes argent, and sometimes substituted a lion for the dexter one; the earliest record of the royal beast so placed.

THE FOUNDER OF THE IRON TRADE.

The opening address of the President of the Manchester Association of Engineers (Alderman Bailey), delivered on the 9th, gives an interesting sketch of the life and labours of John Wilkinson, who called himself, and not without justice, "the father of the iron trade," and who was the maker (about 1750) of the first iron boat, which was constructed to carry peat along a canal cut for it. The following extract from Alderman Bailey's historical sketch will be of interest to a good many of our readers:—

"Will that swim?" said an indignant local blacksmith, as he threw a horse-shoe with some violence into his water-trough, on being told that John Wilkinson was engaged in making an iron boat. The first boat was made at Wilson House, in Cartmell parish.

John Wilkinson was in partnership with his brother and father, their chief business being in the manufacture of flat-irons for smoothing linen. It is related that John's father bought his iron in the molten state, by the ladleful; it was then carried across the high road to the small foundry, and there run into these smoothing-irons.

The Wilkinsons prospered, business increased, for John invented the box iron with its inside heating-piece. They erected more extensive works in the neighbourhood, engaged themselves in smelting the rich hematite ores, or what was then called Furness iron. The furnaces were at Nelson House, near Lindal, in the parish of Cartmell. They used the peat and turf of the district for fuel, and to get a proper supply of this to the furnace John Wilkinson designed a short canal, which was cut through the turbary, and the iron boat was constructed, which not only excited the emotions of the astonished village blacksmith, but also created great astonishment along the whole country side.

This first small iron boat at Cartmell was succeeded by others made by Wilkinson. The pioneers of inland navigation were at work, pamphlets were written, folios were printed to show how the wealth of the country might be increased by a proper system of inland navigation. The Duke of Bridgewater, Brindley, Telford, and other enterprising men had created these waterways, the Manchester and Worsley Canal was being imitated, the Birmingham Canal had been finished, and the great Staffordshire Canal ran not far off Wilkinson's furnaces.

Wilkinson had heavy contracts and the boat builders were very busy supplying these new canals with boats, but the Arts of Peace and the Arts of War created a great demand for John Wilkinson's manufacture. He obtained the contract for the Paris Water Works, which included all the pipes, tubes, cylinders, and iron work for that enormous undertaking, and which was considered the greatest of its kind of that day. His friend, James Watt, having designed the steam-engine, and Wilkinson not being able to get boats of wood to convey the materials for the above contract, determined to design boats of iron to go down the Severn and the canals. He was also busy smuggling cast-iron guns 4 ft. long into France. These were consigned under the name of water piping,—sometimes merely as metal water-pipes,—to be re-cast into guns when they got to France. They were taken from Willey by means of a cast-iron tramway to the banks of the Severn.

The next iron barge that was made was called the *Trial*, and, according to the record of the day, Wilkinson set to work building this at Willey with John Jones as chief smith,—John O'Lincoln he was called. During the spring of 1787, John O'Lincoln's hammer and hands were busily engaged fastening plate after plate, and many jokes were cracked by the passers-by in terms considered very expressive by that class of men in those days, and sometimes even now indulged in by men who have a famine-stricken vocabulary.

The *Trial* was finished in 1787, and a great crowd came down to witness the launch of the iron barge. As a chronicler of the time says, "The woods wore their summer foliage, the sun sent down approving smiles, and the Apley rookery, disturbed by the incursive visitors, furnished a hovering cloud of sable spectators, the plodding ploughman left his task, the artisan his shop, the pedlar his pack, and swarms of sturdy yeomen from vale and upland, dell and dingle, came pouring down to witness the novelty of the launch. 'Will she swim?' 'Will she work and prove manageable on the water, and who will he get to work her?' were questions that served to occupy the time. Never did son of Vulcan look more proud than John O'Lincoln: if his descent direct from the patron god had been made out and patented, he could not have felt more so. A discharge of thirty-two pounders told that all was ready, and before the white curling smoke had well died away, the newly-christened *Trial* descended the way-pieces into the river with a splash."

The following is Wilkinson's account of the event in a letter to Mr. Stockdale:—

"Broseley, July 17th, 1787.

Yesterday week my iron boat was launched. It answers all my expectations, and has convinced the unbelievers, who were 999 in 1,000. It will be a nine days' wonder, and then be like Columbus's egg."*

Wilkinson went on building other barges. In a letter dated Bradley Iron Works, 20th October, 1787, he says:—

"There have been two iron vessels launched in my service since September 1st, one is a canal boat for this navigation, the other a barge of 40 tons for the River Severn. The last was floated on Monday, and is, I expect now at Stourport with a lading of bar-iron. My clerk at Broseley advises me that she swims remarkably light, and exceeds even my own expectations."

The *Universal Magazine* for that year says:—

"November 8th, an iron vessel built by John Wilkinson was lately launched at Willey Wharf. She is perfectly tight, moves very easily on the water, and draws about 8 in. with every accompaniment on board."

The *Gentleman's Magazine* of the same year had a similar notice. Others caught up the idea, and iron barges have been common to the Severn ever since. In 1810 John Onions & Son, of Broseley, built a lighter at Brierley, which was sent in parts to a Mr. Bishop, of London, which I believe was the first iron vessel on the Thames.

Wilkinson made many experiments in coking coal in closed ovens for the purpose of extracting oil, and also for producing coke. It seems that Lord Dundonald afterwards carried on this process at Callicutts, not far from Wilkinson's works, and it is not known whether Wilkinson or Lord Dundonald was the originator. Dundonald as a boy studied chemistry under his uncle at the Tuckies, near the Severn. As Admiral Dundonald he was known afterwards as the last of our old sea-dogs, and it is supposed that from these studies he gleaned information which enabled him to propound to the Government of the day a plan for the destruction of the Russian stronghold.

Wilkinson's experiments with what were called "stew-coal-ovens" enabled him to drive off the gas from the coal, and to distil therefrom the tar. He obtained about 4 lb. of tar from every hundredweight of coal, and from this product oils were again extracted, and varnishes of some value for the purpose of japanning. Every gallon of tar that he made was found to produce half the quantity of volatile oil, whilst the residuum was pronounced to be equal to the best asphaltum. The process consisted in conveying the liberated gases from the ovens by means of flues into funnels built of bricks supported by arches, and formed into gutters for the conveyance of water. The water was required to condense the tar, which, falling to the bottom, was conveyed by pipes into a reservoir. From this it was pumped into a large boiler, and then brought by heating to a proper consistency, according to requirements.

It is said that he sold great quantities of this product for the use of the British Navy.

He had almost invented illuminating gas before Murdoch, who was busily engaged at that time in his small experiments in Cornwall. The gas that Wilkinson made served all the purposes except that of illumination, for by reason of his not making provision for it to escape in sufficient quantity, it would take fire and explode, and blow out all the heavy masonry round about and destroy the apparatus.

Wilkinson also made many experiments in connexion with the hot-blast for furnaces, especially with a method for re-melting old slag. We are told that it was customary at that time, —as even it has been down to a recent period,

* The maker's matter-of-fact way of recording the success which so astonished the multitude is very characteristic; but it is curious that, even in those days, so many people should have been sceptical about an iron boat floating, when many of them must have seen for themselves that a metal pot or saucepan would float on water.—Ed.

—to use pipes made of leather for conveying the hot-blast into the tuyere, but their use had to be discontinued because of being scorched. Long before the hot-blast was re-introduced as a discovery, pipes of metal, sliding one into another, telescope fashion, were used. He invented the double-acting blowing engine, copied no doubt from the cylinders which he made and bored for the firm of Boulton & Watt.

Coal-getting machines were designed by Wilkinson; these he gave the name of "iron men." It is said they answered the purpose for which they were designed, viz., that of cutting the coal on both sides from top to bottom after they had been holed. They were used at Bradley and Broseley, but at both places the colliers refused to set up the props and to gather the coal after the "iron men" had worked it, arguing that if Wilkinson's "iron men" did the one they must do the other.

The First Iron Bridge if not actually designed by Wilkinson, was to a very great extent the production of his constructive genius. This bridge was cast at Coalbrookdale and erected in the year 1779. It has a span of 100 ft. 6 in., and weighs 370½ tons. It was proposed to put a bridge across the Severn to connect the Madeley and Broseley banks of the river, and Wilkinson at once proposed that cast-iron should be employed for the purpose. Wilkinson was declared to be iron mad. He was a large shareholder and a wealthy man of the neighbourhood, and it was decided at last to carry out his suggestion. Wilkinson received the co-operation of Abraham Darby and others. This iron bridge was the first of its kind. It was deemed when erected as a great triumph of enterprise, skill, and unique engineering.

Those who are familiar with the troubles and difficulties of James Watt in bringing out his steam engines will probably recollect that many of the difficulties of the firm of Boulton & Watt ceased when John Wilkinson adapted the machinery, which he had used for boring cannon to the boring of engine cylinders. He not only designed proper boring tackle for James Watt, but the first engine made at the new works, Soho, was one ordered by John Wilkinson to blow the bellows of his iron works at Broseley. We are told that this new engine created a great sensation. It was erected about the beginning of 1776. Wilkinson found that Watt had given him what he wanted to blow his furnaces, and that he had placed at his disposal a power capable of the nicest, and, at the same time, the most stupendous operations.

This engine was not coupled up in a direct manner to the bellows: it was simply used for pumping up the water to the pool dams to propel the great water-wheels. Most of the first engines in that neighbourhood were used ignobly to assist the water-wheels, the water supply being pumped back from the tail race.

The new steam engine, in the same way, played second fiddle at Coalbrookdale, Willey, Broseley works, and at those of Bentnall, belonging to Squire Harris, and others of that district.

James Watt had a very high notion of Wilkinson's abilities. In looking over the correspondence with his cashier and his managers, I have been very much impressed with the firm grasp Wilkinson seems to have had of his business, and of his careful attention to the most minute details. There are instructions for book-keeping, instructions for the mixture of metal, and in one letter he gives the most minute details of the proper amount of malt, hops, and sugar for the brewing of ale for his workmen employed in his lead and iron works.

Wilkinson joined with Watt, Boulton, and Wedgwood as large shareholders in the Cornish mines.

James Watt sent his son to Mr. Wilkinson's ironworks at Bersham, "where he has also to study practical book-keeping, geometry, and algebra; and he has also," according to the letter of James Watt, "to work three hours a day in the carpenter's shop. I intend that he should stay there a year; I am glad I am able to send him to Mr. Wilkinson's ironworks, as it will fit him for some employment not so precarious as my own." It will be evident from this, that although Watt was busy booking orders for his steam engine, and had been at work, and remarkably successful with them, for over ten or twelve years, yet he seems afraid to let his own son learn the business. He is evidently doubtful of his own success: and this was in the year 1784.

Boulton in speaking of Wilkinson in one of his letters, says:—"They are all frozen up, and were it not for Wilkinson's steam mill, the poor nailers must have perished; but his mill goes on rolling and slitting ten tons of iron a day, which is carried away as fast as it can be bundled up, and thus the employment and the assistance of these poor people are secured."

Wilkinson was wont to say, more is done by scheming than by working, and when a scheming fit came over him it seems he would go to bed, and, to prevent his falling asleep, he would hold an iron ball in his hand over a copper basin, so that if he caught an idea, and he fell asleep before he had worked it out, the ball would fall into the basin and make a noise and awaken him.

Under Pitt's administration of 1784, the finances of the country were in a bad state, and it was proposed by certain legislators to make times good by making commodities dear. It was about this time or a little before, that the law was passed which gave a premium for every sack of corn that was sent out of the country when corn was below a certain price, a clumsy method of increasing the value of the quartern loaf for the benefit of corn-growers. This new scheme was to lay a tax on coal, iron, and copper. Wilkinson, Watt, and Wedgwood took alarm. The serious gravity of this measure is probably more apparent to us, as engineers, than it would be to many in those days. Wilkinson went with a deputation to London, and urged Pitt to withdraw the Bill. He pointed out that the cheaper English iron, copper, and coal are, the less likely are foreign people to engage in the trade; "keep down the price of iron and coal and the Frenchman will never engage in it."

He took an active part in resisting the attempts to pass a law to make book debts liable for interest, and showed how it would check enterprise and place the commercial classes at the mercy of the landlords, who always would be paid in full; and in talking about his interviews with Pitt, he would laughingly say, that although he himself, besides knowing as much of the iron trade as any one, and besides that being cram full of statistics, he found Pitt knew quite as much about the iron trade as any of the deputation.

The annals of Cartmel, by James Stockdale, gives an interesting account of John Wilkinson, who made an engine for Mr. Stockdale's grandfather from the designs of Watt. Details are given of this engine with an account of the method of payment by royalty, in a letter written by James Watt, to raise eight cubic feet of water per second, 20 ft. high, required from 184 lb. to 200 lb. of good coal per hour when going at twelve strokes per minute, the premium to be reckoned at 184 lb. of coal per hour, equivalent to about 33 cwt. per day, as a common engine will burn three times as much, —I suppose by common engine was meant the single-acting Newcomen type,—the total saving would be 22 cwt. per day, which at 12s. a ton comes to 13s. 2¼d. per day, or, for 14,400 strokes, that being at the rate of 9s. 2d. for each 10,000 strokes, and this was the royalty charge payable half-yearly by the index counter fixed on the beam; the cost of the engine was about 1,000*l*.

When this engine was fixed at Carke, the noise it made was so great that it could be heard at Newton, five miles away. It is said of one in Cornwall, which created such a din as to be intolerable to the men in charge, who, on trying to make it work quieter, the proprietor would not permit, as he observed the noise it created was in proportion to the power it exerted.

About the year 1765, John Wilkinson built a house on the north side of Castle Head Rock, which is a mountain of limestone on the river Winster, in Cartmell, a most interesting account of which as a stronghold of the ancient Britons, Romans, Saxons, Danes, and Norwegians, will be found in the "Annals of Cartmel," by Mr. James Stockdale. The mansion built by Mr. Wilkinson is now in the occupation of Mr. Edward Mucklow, to whom I beg to take this public opportunity of thanking for the assistance he has rendered me in material for the preparation of this story of the old iron master. When the Wilkinsons built this house it was covered with a novel roof made of copper, which did not answer well, as a lead one had to replace it. The bare rock was covered in almost inaccessible places with rich soil which had to be carried up on horseback, and the barren waste was converted into beautiful grass, shrubberies, ferneries, and luxuriant floral life. In making these alterations many old coins, rings, and flint instruments of antiquarian interest were discovered, about which his brother-in-law, Dr. Priestley, wrote a very interesting description.

The men who met at Castle Head when John Wilkinson was in his prime were those whose names will be for ever identified with intellectual achievements of that period. Members of the Lunar Society met round his board, sometimes they met at Dr. Priestley's house at Soho, and sometimes at Boulton's, and then at James Watt's. It was called the Lunar Society because their meetings were held when the moon was at full. Wedgwood, the potter; Franklin, famous for his experiments with lightning and electricity; Murdock, of gas-lighting celebrity; Dr. Parr, Sir Joseph Banks, Sir William Herschell, Baron Reden, and other earnest labourers in the field of science and art, lovers of the true and the beautiful, were members of this brilliant coterie.

At Carke, in the neighbourhood, the inn had over the door a perfect facsimile of the first engine made by John Wilkinson from Watt's design. Steam engines in those days were called fire-engines, and that was the name of the inn; it was there until a very recent period; indeed, only within the last twelve or fifteen years, when the tenant, having to make alterations, caused the sign-board to be removed. As it was a fine-grained mahogany it was made into a table, now in the possession of a family in the neighbourhood.

John Wilkinson's father was a labourer, and John had very little education. By the power of original genius and hard work Wilkinson became a very wealthy man, and was justly entitled to the position he always assumed as the "Father of the Iron trade."

A grand banquet was given to him when he finished his contract of the Paris Waterworks, in which his achievements as an engineer were eloquently described by the delighted Frenchmen. He said that if the Frenchmen gave over the fiddling and dancing, and took to engineering, Englishmen would have to look to their laurels.

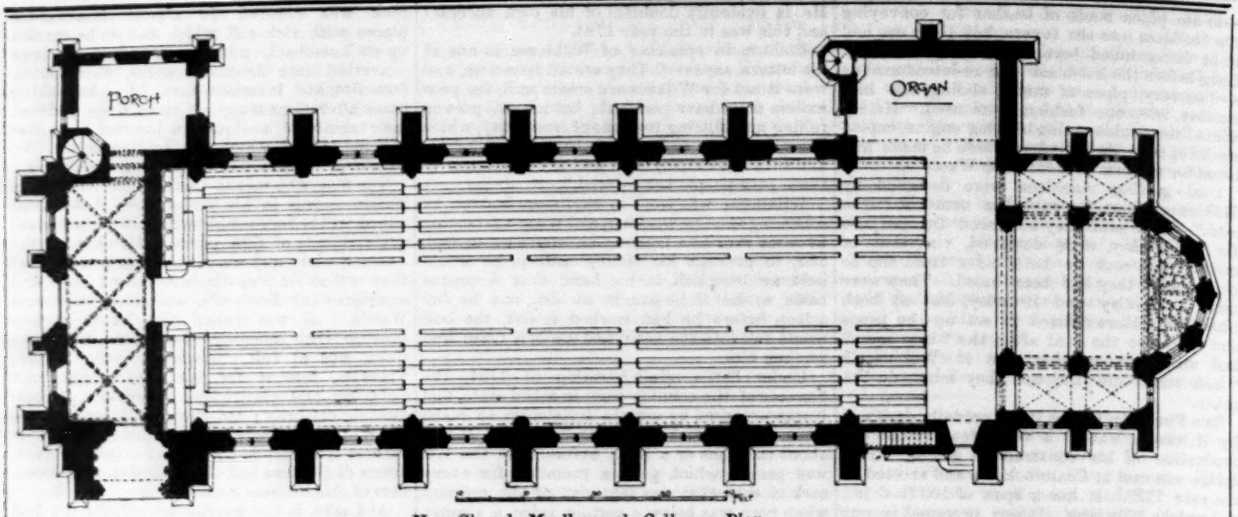
In the latter years of his life he lived at Castle Head. He prepared his coffin and the large cast-iron pyramidal tomb, which I have mentioned, and gave instructions as to the manner of his funeral. He died in the eightieth year of his age, on July 14th, 1808, and was buried in his garden at Castle Head; but the estates having been sold, the body was afterwards removed and buried in a grave in consecrated ground, within the very beautiful snow-white chapel of Lindal, in Cartmell.

THE ARCHITECTURAL ASSOCIATION

CONVERSAZIONE.

The opening *conversazione* of this vigorous society, which has done such good work in the past in educating our young architects, was held this year in the rooms in Conduit-street, where architecture is so much at home. Of late there has been a tendency on the part of the Association to go elsewhere for a change when keeping holiday, and for several years the *conversazione* has been held at Prince's Hall in Piccadilly. But since the great crush on a certain *conversazione* night the numbers attending the meeting have sensibly diminished, and, except in the great gallery where the concert was held, the rooms last week were not inconveniently crowded at any time. The President's opening speech, which used to be a chief feature of the entertainment, has now been abandoned, for, notwithstanding the interest which these often clever addresses had for the members themselves, they had come to be considered a bore by the ladies, and an almost intolerable nuisance by the unfortunate presidents themselves.

The actual entertainment this year consisted chiefly of a capital concert held in what is known as the large gallery, which was filled with seats and densely packed with listeners from quite early in the evening, so that for a long time it was very difficult to get in to see the exhibits on the walls. In the concert, following a selection of popular airs played by the band of the 2nd Life Guards, the chief performers were Miss Mary Morgan, Miss Edith Touzeau, Mr. W. H. Brereton, Mr. Harold



New Chapel, Marlborough College.—Plan.

Savery, and, at the piano, Mr. F. R. Kinkee. Mrs. Dyke accompanied the songs.

In the interval between the parts of the concert Mr. Cole A. Adams, the popular president of two years ago, gave a series of dramatic sketches which were exceedingly amusing, that which called forth the greatest applause being the last, a sketch of a French play as it probably appears to the majority of an English audience, who can understand but solitary words and phrases at not very frequent intervals.

The evening was an exciting one for the numerous competitors for the prizes given by and through the Association, for the names of the prize winners were made public for the first time by a list posted at the entrance, of which the following is a copy:—

The A.A. Travelling Studentship (20*l.* to travel for five weeks and medal).—1st, R. W. Paul; 2nd, 5*l.*, J. E. Key.

Aldwinckle Travelling Studentship.—Not awarded.

The A.A. Medal and Ten Guineas.—W. A. Webb. Honourable Mentions: H. P. B. Downing, W. H. Raffles, W. F. Kelsey, H. H. Gordon.

Essay Prize (Ten Guineas).—H. E. Mallet. The judges suggest that an extra medal should be given to T. L. Worthington. Honourable mentions: A. B. Mitchell, T. E. Key, H. Wilson.

The Architectural Union Company's Prize (5*l.*)—H. J. White; 2nd, 2*l.* 10s., J. M. Brooks.

Elementary Class of Design. Section I.—1st, 2*l.* 2s., H. S. Wood; 2nd, 1*l.* 1s., H. G. Lidstone. Honourable mention, L. Jacob.

Elementary Class of Design. Section II.—1st, 2*l.* 2s., A. B. Yeates; 2nd, 1*l.* 1s., H. S. Wood. Honourable mention, B. M. Southall.

Elementary Class of Construction.—1st, 3*l.* 3s., B. M. Southall; 2nd, 2*l.* 2s., F. C. Aguttar.

Class of Design.—1st, 3*l.* 3s., R. A. Rix; 2nd, 2*l.* 2s., E. F. L. Seaman.

Class of Colour Decoration (3*l.* 3s. and Mr. Vacher's Prize).—H. Wilson.

Class of Construction.—1st, 3*l.* 3s., C. C. Winmill; 2nd, 2*l.* 2s., R. A. Rix.

Advanced Class of Construction (3*l.* 3s.).—J. Hudson.

Class for the Study of Quantities and Specifications.—1st, 3*l.* 3s., E. J. Cooper; 2nd, 2*l.* 2s., J. Hudson and B. Potter aeq.

Sketch-Book Prizes.—Title page. 5*l.* 5s., G. G. Woodward. Two transfers, 4*l.* 4s., S. Vacher. Three plates, 3*l.* 3s., G. J. Oakeshott.

Lectures in connexion with the Classes of Design.—1st, 3*l.* 3s., B. M. Southall.

Lectures in connexion with the Classes of Construction.—1st, 3*l.* 3s., T. C. Aguttar; 2nd, 2*l.* 2s., W. D. Gravell; 3rd, 1*l.* 1s., B. F. Fletcher.

At the next meeting the several prizes will be presented to these gentlemen, who, judging from the fine collections of drawings on the walls, have well earned them. We noticed especially some of the designs for a village church, several of which we should very much like to see executed in place of some that are being built in different parts of the country. The collection of drawings exhibited by the Colour Decoration class was also particularly good; and, above all, Mr. R. W. Paul's clean, neat, and telling sketches were worth close study.

Besides the students' drawings, the rooms were well filled with objects of interest. In the Institute Library was a collection of Mr. Robinson's photographs and a quantity of German Mediæval wood-carving, among which a diptych representing the "Adoration of the Magi," was especially noticeable. There were also some beautiful water-colour sketches by Mr. R. P. Spiers, and a terra-cotta panel by Mr. Tinworth. In the Institute meeting-room, —all the Institute rooms were very kindly lent for the occasion,—was some furniture and metal-work by Mr. Longden; and in the Council-room a magnificent collection of Dr. Salviati's delicate Venetian glass, some metal-work by Messrs. Hart, Son, & Peard, and some very fine tiles and pottery by Mr. Wm. de Morgan.

Downstairs in the large gallery were materials for curtains and hangings and wall-papers by Mr. Wm. Morris, and some of Messrs. Jeffrey & Co.'s papers designed by Messrs. Walter Crane, Lewis F. Day, Sydney Vacher, and others of our best decorative artists. Also an exhibit of metal-work by Messrs. Verity, and a further collection by Messrs. Hart, Son, & Peard. On the walls of the smaller gallery were some of Messrs. Woollams & Co.'s wall-papers, a fine piece of plaster frieze by Messrs. Jackson, some beautiful wrought ironwork by Mr. Alfred Newman, and some other good decorative materials.

The members, if we may judge by the general good humour of all, spent a very pleasant evening, though it was somewhat marred by the absence of the President, Mr. J. A. Gotch, who telegraphed to say that he had met with an accident and could not be present.

Illustrations.

NEW CHAPEL, MARLBOROUGH COLLEGE.

We give this week an interior view and a plan of the new chapel at Marlborough College, designed by Messrs. Bodley & Garner, which has replaced that built nearly forty years ago from the designs of Blore. As will be seen, the plan is what may now be called the accepted college chapel plan,—a one-aisled chapel, with an ante-chapel, narthex shape on plan, stretching across the west end. The general character of the work is, as will be seen from the view (reproduced from a pencil drawing lent by the architects), pure Gothic reproduction, a form of modern architecture (or ancient architecture) in which the architects of this chapel perhaps have hardly their equal among their contemporaries at the present moment. The windows are by Messrs. Clayton & Bell and Messrs. Morris & Co. The stone-carving has been done by Mr. McCulloch, the figures by Messrs. Farmer & Brindley, the wood-carving by Mr. Wilmut (of Bristol), the decorations by Mr. Powell (of Lincoln). The builders were Messrs. Stephens & Bastow. The cost of the whole has been about 30,000*l.*; and the Master is inviting contributions from Old Marlburians and others who are interested for some further work,—a lectern, some additional stained-glass windows, &c.

The paintings in the panelling over the seats are, we understand, a series of pictures by Mr. Spencer Stanhope, which were painted before, and now transferred to the new chapel. We should have preferred that English boys should see before them in chapel something more manly than Mr. Spencer Stanhope's weak and superstitious sentimentalities; but we suppose that is not our business.

[SALTSKÖG, NEAR STOCKHOLM.

This illustration shows a country-house for Herr C. F. Liljevalch, of Stockholm.

The site,—the edge of a plateau above which the hill rises again,—commands extensive views to the south (the elevation shown in our illustration). The principal rooms are of course placed with this aspect.

The house is built entirely of timber, on a basement of granite, after the manner of the country, except, of course, the chimneys, which are of brick, stoves being used throughout instead of open fireplaces; there is a large brick oven attached to the kitchen.

The exterior face is covered with inch weather boarding, coloured bright red; the barge-boards, architrave, strings, &c., are stained a grey black, the casements being white. The roof is covered with grey green slates.

The hall and dining-room, shown in the small sketch, are divided by a movable dwarf screen, and can be converted into a saloon 26 ft. by 38 ft., the landing of the staircase across the northern end projecting to form a minstrel's gallery; the woodwork here is painted and flatted with a frieze of Japanese paper.

The work is being carried out by local workmen, from the designs and details of Mr. Howard Ince, from whose drawing in the recent Royal Academy Exhibition our illustration is taken.

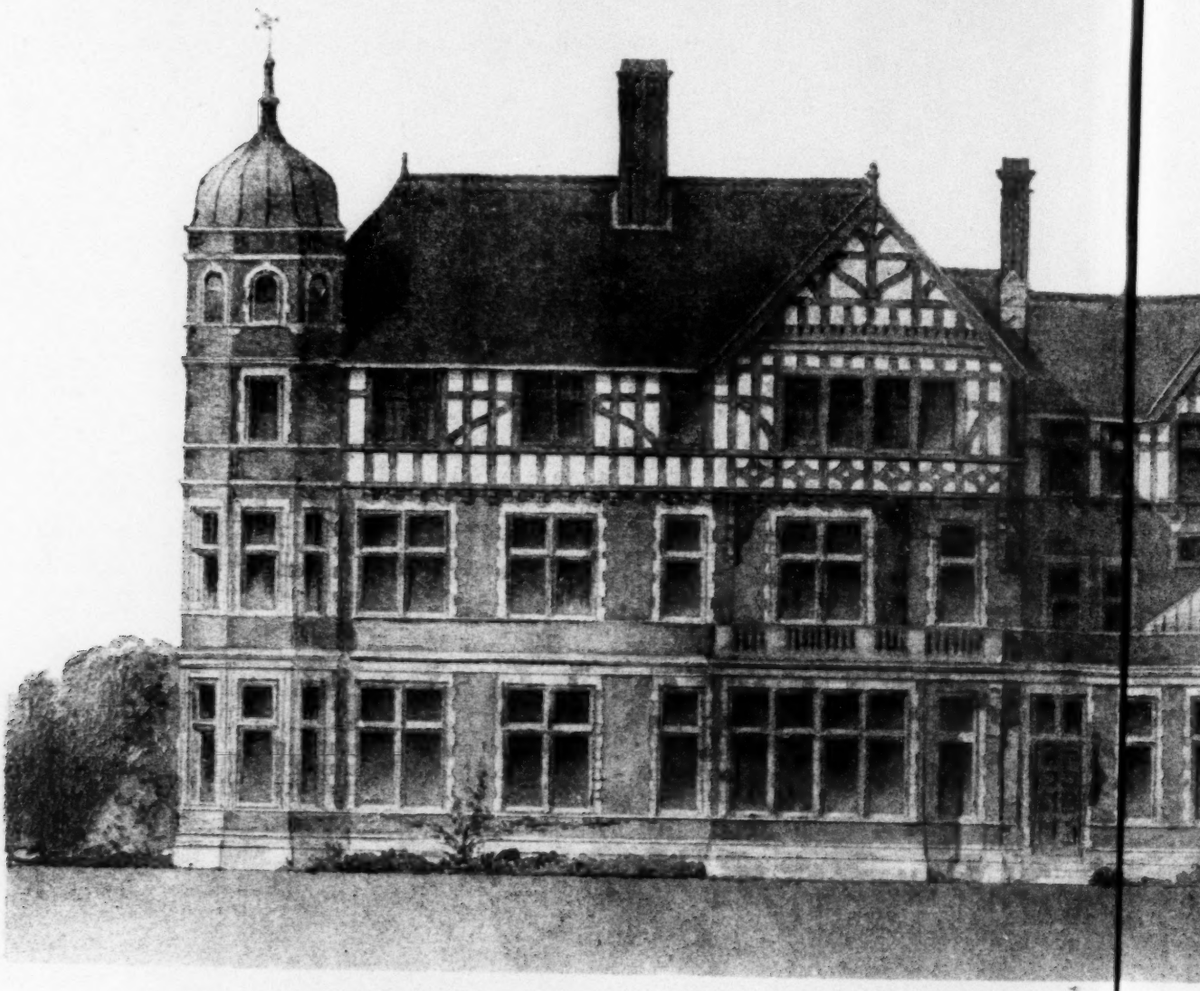
HOUSE AT OTFORD, NEAR SEVENOAKS.

The illustrations show the ground-plan, the south or garden front, and the west or entrance front of this building, which is being erected on a fine site near Otford, and overlooking an extensive tract of country. The nature of the site,—a very sloping one,—rendered it necessary to extend the building lengthways without giving it extreme depth, and the plan has been arranged to suit this condition.

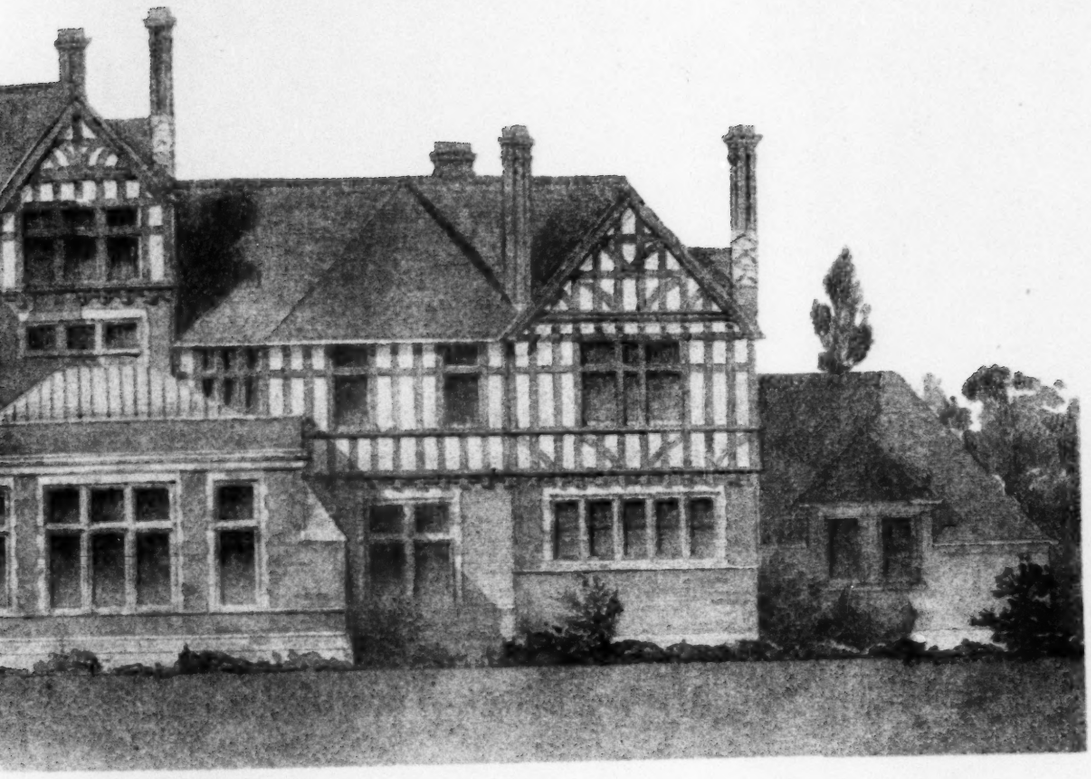
The materials being used are red bricks with terra-cotta dressings, and a certain amount of half-timbered work in the upper parts of the building. The roofs are tiled, and the general treatment is rich without extreme elaboration.

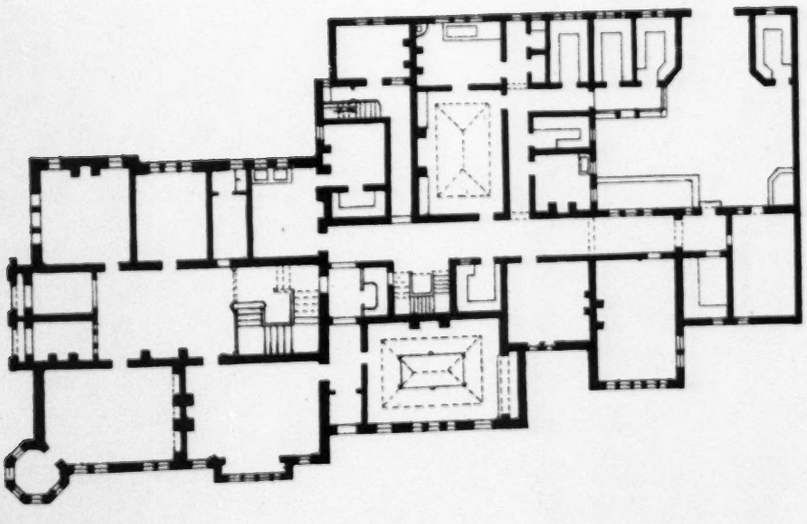
The general contractor is Mr. A. Bush, of Gower-street, who is also building the stabling. The clerk of works is Mr. James Redden. The architects are Messrs. Roger Smith and Gale. The house, stables, and out-buildings are to be lighted with electric light by the Edison and Swan Company.

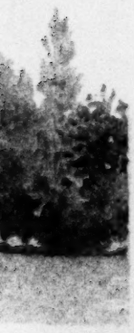
Otford is a place of some note, having been for many years,—at least as far back as the fourteenth century,—a residence of the archbishops of Canterbury. Their palace here was rebuilt at great expense by Archbishop Warham, and was ceded by Cranmer to Henry VIII. The manor remained in the hands of the Crown till the death of Charles I. A few fragments of the building serve to mark the site, which is a mile away from that of the new building and down in the valley, while the new site is on the breezy slopes of the chalk hills.



HOUSE AT OTFORD, KENT.—MESSRS. ROGER







INK PHOTO. SPRAGUE & Co. 44, MARTINS LANE, CANNON ST. LONDON, E.C.

. ROGER SMITH AND GALE, ARCHITECTS.

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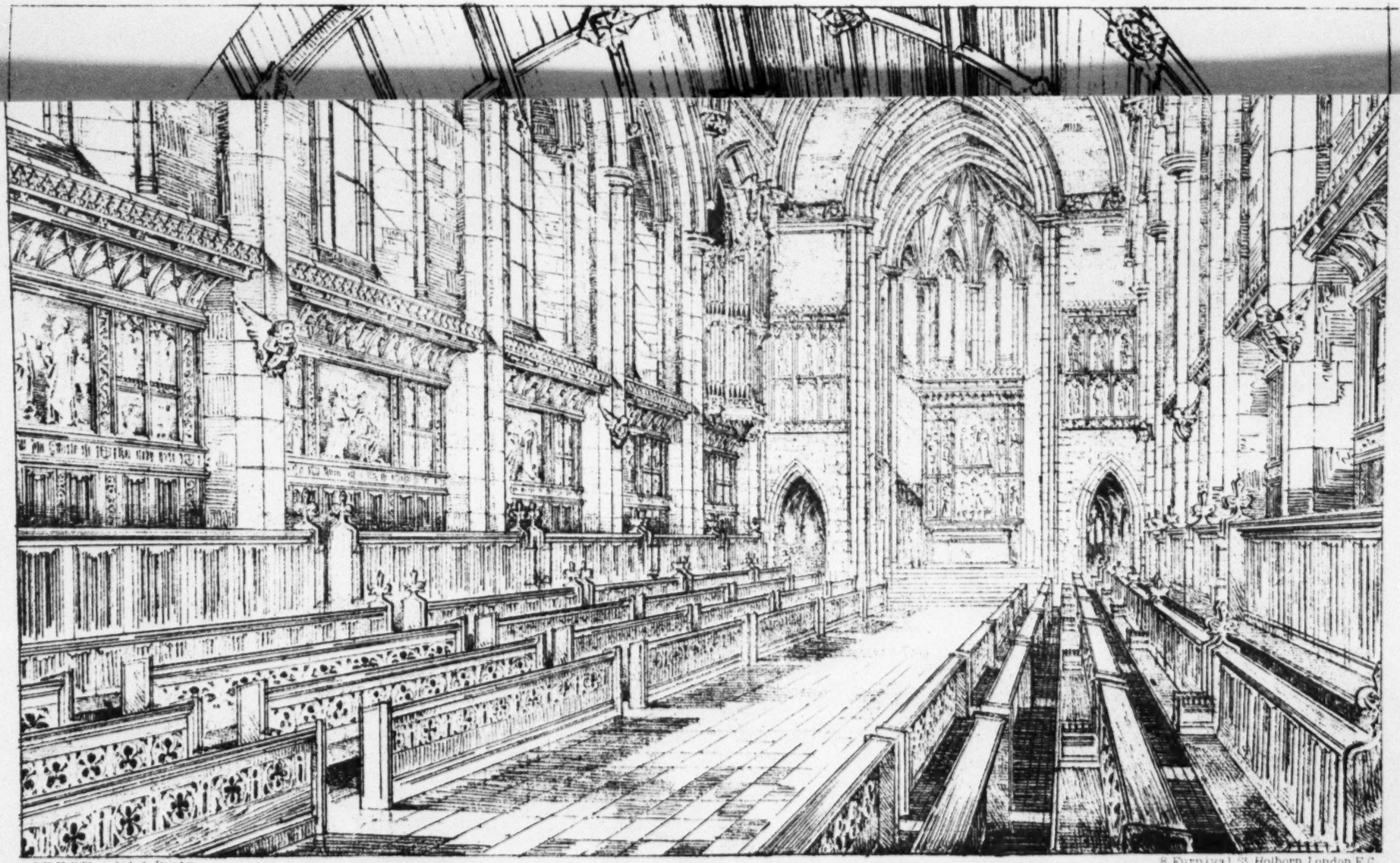

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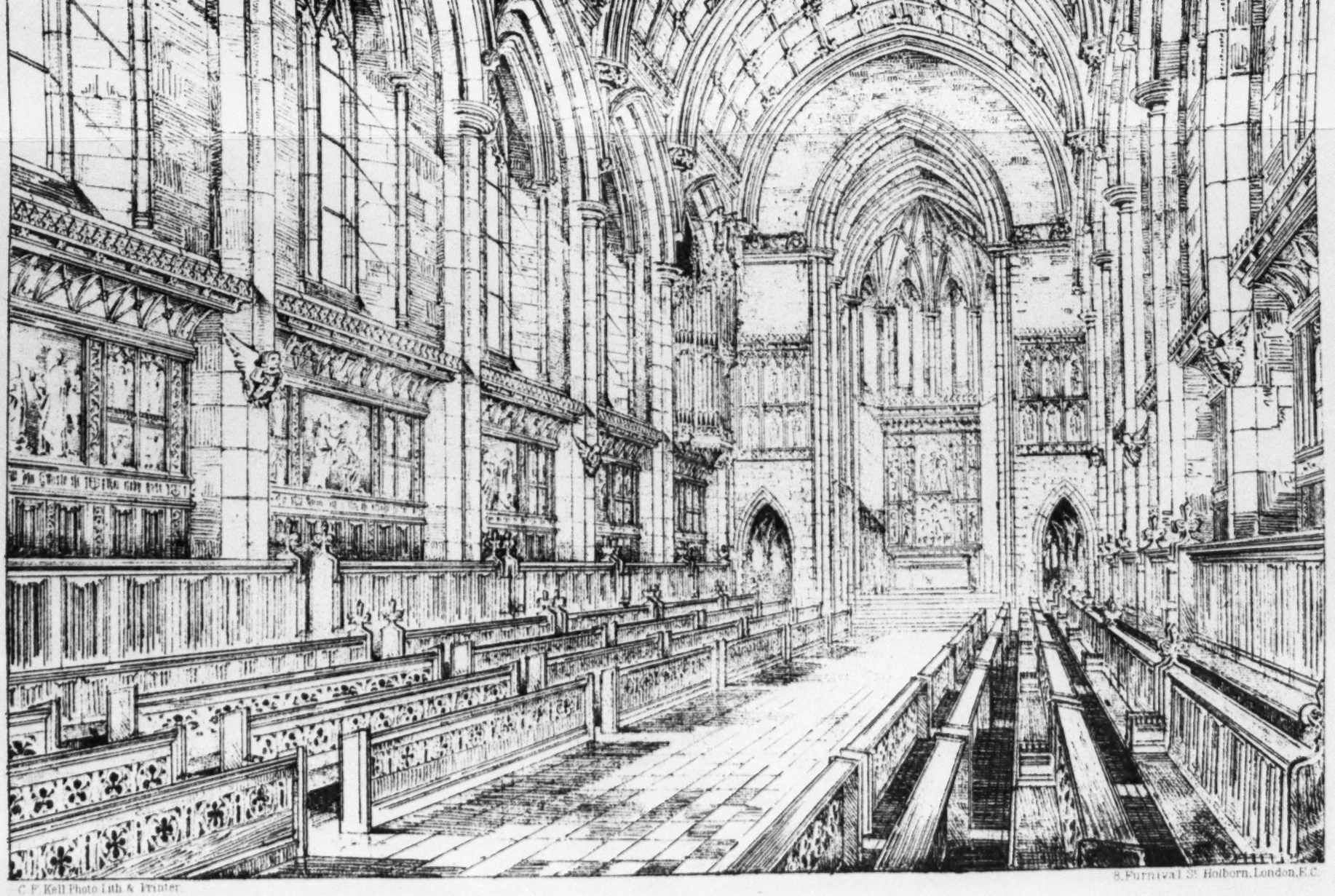
MARLBOROUGH COLLEGE CHAPEL.—Messrs. G. F. Bodley, A.R.A., and T. Garner, Architects.



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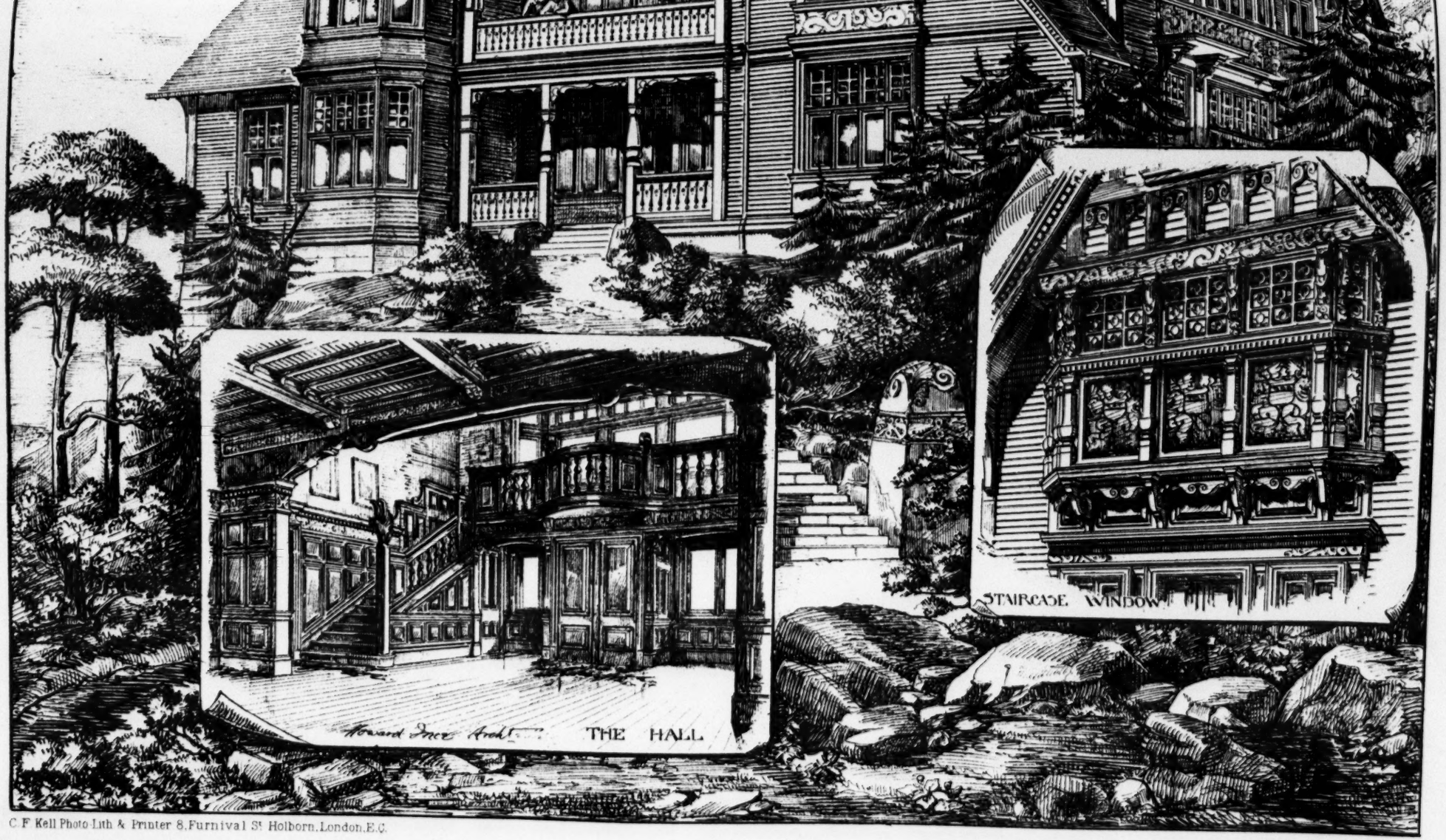
MARLBOROUGH COLLEGE CHAPEL.—Messrs. G. F. Bodley, A.R.A., and T. Garner, Architects.

SALTSKOG
SWEDEN



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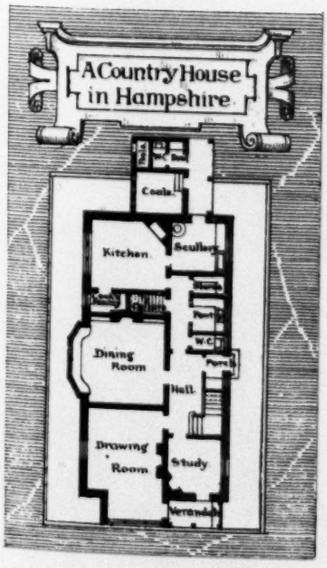
HOUSE NEAR STOCKHOLM, SWEDEN. MR. J. HOWARD INCE, ARCHITECT.



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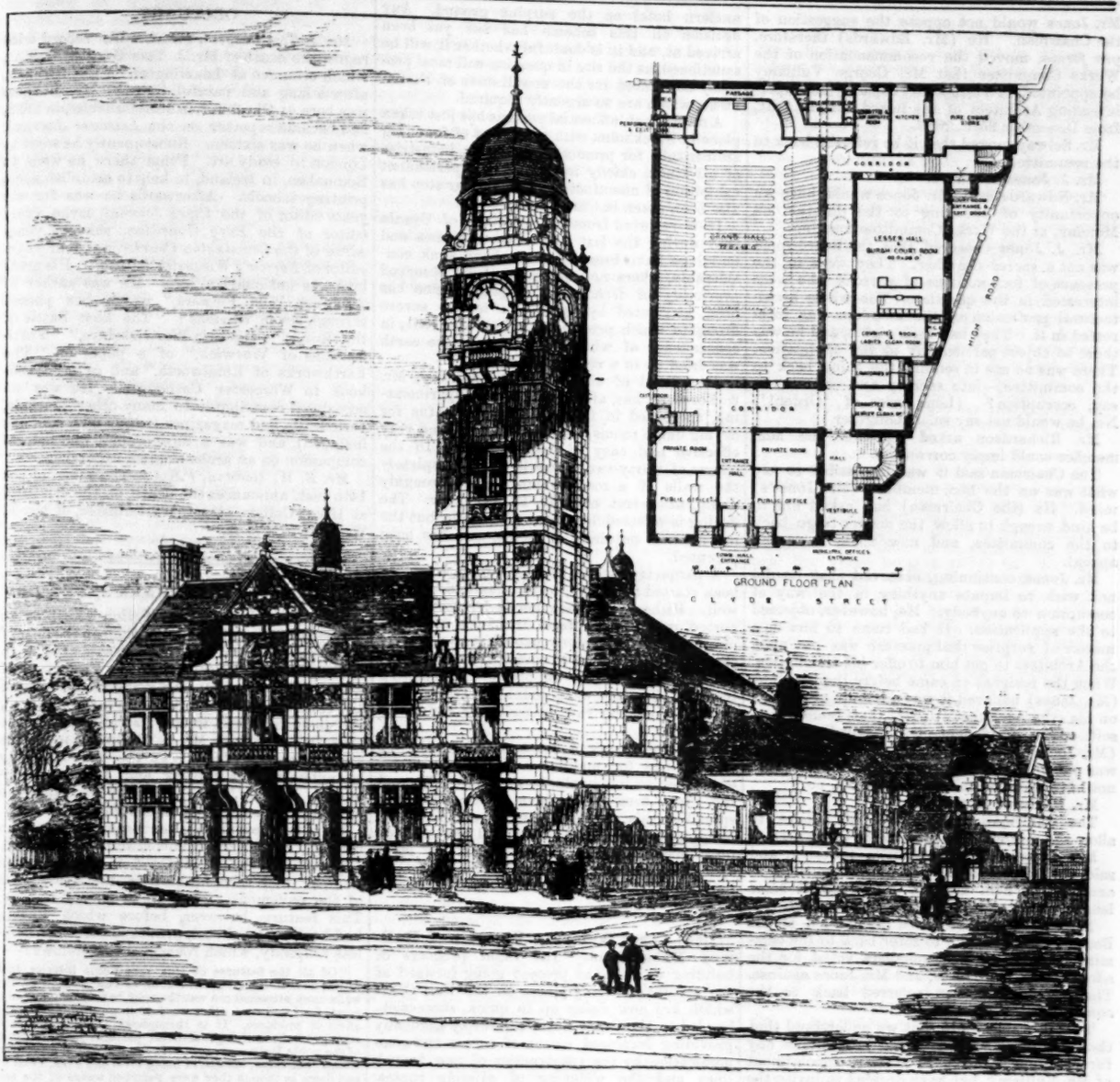
A HOUSE IN HAMPSHIRE.—Messrs. Wyatt and Spiers, Architects.



New Town Hall, Motherwell.—Mr. J. B. Wilson, Architect.

PARK LODGE AND ENTRANCE GATES.

The above was designed for Mr. J. P. Sheppard, of Kingston-on-Thames, to cost 600*l*. The ground-story is of Lawrence's hard pressed red bricks, with all angles rubbed and gauged, the piers to the gates being of red rubbers set in putty, with red concrete caps. The upper story is half-timbered in oak, filled in with half-brick, with stucco exterior, and the roof is covered with Collier's sanded faced tiles.

The drawing from which this plate is taken was exhibited in the Royal Academy Exhibition of this year, and Mr. F. W. Lacey, of Brentford, is the architect.

"HOUSE IN HAMPSHIRE."

This is a small country house, which has been erected near to Basingstoke. The lower portion is built of 14-in. hollow brickwork, the 4½-in. thickness being on the outside in stretcher bond; the upper portion is in 9-inch brickwork, built solid and covered with rough cast.

The plan of the ground-floor is appended. On the first floor there are four bedrooms, dressing-room, bath-room, linen-room, housemaid's closet, and W.C., and in the roof there are two attics and a box-room. There are also cellars under the drawing-room and dining-room. The work has been carried out by Mr. J. J. B. Cooper, builder, of Odiham, from the designs of Messrs. Wyatt & Spiers, of London.

NEW TOWN HALL, MOTHERWELL.

Operations have just been commenced for the erection of a new Town Hall and Municipal Offices at Motherwell, N.B., a view of which is given above. The building is situated on a prominent site in Clyde-street, triangular in form, and will be open on three sides. The Municipal Offices occupy the first floor of the front building, having entrance in the base of the tower, and comprise a council-room, 30 ft. by 20 ft., with retiring-rooms, &c., and offices for Borough Engineer and Town Clerk. On the ground-floor are two offices intended for letting. The halls are placed behind the front block, the main entrance being in the centre of the front, but with egress doors to each of the side streets. The Town Hall is arranged with side and end galleries, and will be seated for 1,200 persons, and the lesser hall in connexion, which would serve as supper-room for assemblies, will seat over 300 persons. As the lesser hall is also to be used as a court-room, witnesses' and retiring rooms have been provided in connexion, as well as ample cloak-rooms, lavatories, &c., for both halls, and the corridor space is unusually large. The arrangement is such that either of the halls can be used apart, with separate entrances, &c., or the whole occupied *en suite* when desired. Accommodation for Burgh fire engine, caretaker's house, &c., has also been provided.

The whole external walling will be of white freestone, from the Bellside quarries, and the roofs are proposed to be covered with green Aberfoyle slates. The total estimated cost of the buildings is 5,500*l*. The contractors are almost entirely local, and the architect is Mr. J. B. Wilson, A.R.I.B.A., Glasgow, the design being selected in competition.

THE SUPERINTENDING ARCHITECT:

METROPOLITAN BOARD OF WORKS.

There seems to be some difficulty as to the reappointment of Mr. Vulliamy. We quote the following report of the proceedings at the last Board meeting from the *Metropolitan* of Saturday last:—

"The Chairman (Sir J. Hogg) said that he understood several members of the Board intended putting questions on the subject of the proposed reappointment of Mr. Vulliamy. He (the Chairman) had given the matter the most careful and anxious consideration in his power, and had likewise consulted more than once the Board's Solicitor on the subject. The matter was a difficult one, and if the Board would allow him the liberty of suggesting a course which he thought would be the best to take in the circumstances it would be to allow the Deputy-Chairman to simply, *pro forma*, move the recommendation on the paper of business, and send the matter back to the Works and General Purposes Committee for reconsideration. (Hear, hear.)

Mr. Shepherd observed that he quite assented to the proposition.

Mr. G. Edwards (Deputy-Chairman) hoped

Mr. Jones would not oppose the suggestion of the Chairman. He (Mr. Edwards) therefore, *pro forma*, moved the recommendation of the Works Committee that Mr. George Vulliamy be appointed, in a temporary capacity, as Superintending Architect of the Board, for one year, from December 25th, 1886.

Mr. Selway moved that it be referred back to the committee.

Mr. J. Jones here rose.

Mr. Edwards said Mr. Jones would have an opportunity of speaking to the question on Monday, at the Works Committee meeting.

Mr. J. Jones observed that the Board-room was not a secret chamber. They were in the presence of four millions of persons who were interested in the question. The whole architectural profession of the kingdom was interested in it. They had their rights, and he was there to object particularly to the application. There was no use in sending the thing back to the committee,—into secrecy and—should he say, corruption? (Loud cries of 'Order!') No, he would not say so. (Laughter.)

Mr. Richardson asked whether the hon. member could imply corruption.

The Chairman said it was impossible to say what was on the hon. member's (Mr. Jones's) mind. He (the Chairman) had asked him to be kind enough to allow the matter to go back to the committee, and now made a second appeal.

Mr. Jones, continuing, observed that he did not wish to impute anything in the way of corruption to anybody. He, however, objected to the application. It had come to him as a matter of surprise that pressure was put upon the Architect to get him to offer his resignation. When the resignation came before the Board he (Mr. Jones) believed it was a tribute of honour on his (the Architect's) part, that, feeling himself to be insufficient, he resigned; but he (Mr. Jones) had learned since that a pressure was put upon the Architect to do what he would not have spontaneously done. ('No, no.')

Mr. Harben rose to order.

The Chairman again asked Mr. Jones to allow the matter to go back to the committee.

Mr. Jones still insisted upon speaking, and said the proposition should be extinguished at once. The hon. member continued at some length, although repeatedly called to order.

The Chairman then asked the opinion of the Board on the question to refer back to the committee, when thirty-six members voted for the adoption of that course, and Mr. Jones against. The matter was then referred back to the committee."

To this we may add that we understand that the Committee have resolved not to take any further steps with regard to the re-appointment of Mr. Vulliamy, but have decided to invite the candidates who have applied for the post of Architect to attend before them on the 22nd instant, with a view to selecting the names of six of their number to submit to the Board.

NOTES FROM SWEDEN.

A SYNDICATE has been formed in Stockholm for the building of an aquarium and winter garden, the drawings for the same, which have been accepted, being those of Herr F. F. Lundin. The design provides for three five-storied buildings, with a common frontage, in Renaissance, the central part of which is destined for the aquarium and winter garden, and the two wings for future enlargements, which, in the meanwhile, are to be let as shops and flats. Several other new buildings are also in contemplation in the Swedish capital, one being a circus, to be built by the German circus proprietor, Herr Schumann, who has for many years been obliged to content himself with the little *manège* at the celebrated pleasure resort, Djurgården. It is also stated in building circles that the same London syndicate which has recently purchased several first-class hotels in some Continental cities has sent a delegate to Scandinavia in order to negotiate for the purchase of a first-class hotel in Copenhagen, Malmö, Gothenburg, Stockholm, and Christiania. The negotiations having failed as regards the Grand Hôtel in Stockholm, this delegate, a Swedish engineer, has proposed to the Government to erect a fine modern theatre in place of the old one now disfiguring the square of Gustavus Adolphus, on the condition that the English syndicate should be permitted to build a first-class modern hotel on the surplus ground. Any decision on this scheme has not yet been arrived at, and it is doubtful whether it will be sanctioned, as the site in question will most probably be wanted for the new Houses of Parliament, which are so urgently required.

A meeting of influential persons has just taken place in Stockholm, with the object of founding an institute for promoting Swedish industries of all kinds, chiefly by means of a permanent exhibition of manufactures. A similar step has also been taken in Christiania.

It is reported from the province of Upsala that during the last few years churches and buildings have been found to have sunk considerably, where no sinking has been observed previously for decades. This phenomenon has been attributed by geologists to the severe droughts which prevailed in 1880 and 1881, in consequence of which the water in the earth was dried up to a very great depth.

An official of the Stockholm Railway, Mr. G. Forsberg, has, after many years' experimenting, succeeded in inventing an apparatus for drying damp rooms, which has been found very effective and easy of management. In the course of thirty-two hours it dried completely the walls of a room which were thoroughly damp, at a cost of only 1d. per hour. The drying is effected by means of hot air, but the invention is naturally a secret, and has been patented.

A parquetry works, the first of its kind, has been started in Malmö, which seems to promise well. Hitherto all such goods have been imported into Sweden from Denmark and Germany; but the present manufacturer asserts that he will be able to compete in both these markets, as well as supplying the building trade of Sweden, on account of the greater cheapness of the raw materials in the latter country.

The great danger of fire arising from the use of shavings for making roofs on sheds and outhouses, so commonly in use in Sweden, and the great fires which have arisen and been spread by this material being carried from one building to another, has decided the various insurance companies in Stockholm to issue special regulations as to the proximity, &c., of buildings thus protected to others.

East Coast Watering Places and Railway Extensions.—The rapid progress of building which is at present going forward at the several watering-places on the East Coast which are now rising up in quick succession, has led to the Great Eastern Railway Company providing increased means of access and communication by the construction of new branch lines and the widening of existing routes. Some of these are already in course of construction, whilst others are about to be commenced. On the estate at Southwold, facing the sea, which was sold last year in several lots, building is now actively progressing, but the want of adequate railway communication is a great drawback to the development of the place, the only means of arrival at it being by a light narrow gauge line commencing at the company's main line at Halesworth, where passengers have to change carriages and proceed on their journey in vehicles resembling tram-cars. Lowestoft is likewise at present only reached by a branch line running eastward from the main line at Beccles, the route being angular and circuitous. In order to render the communication between the two towns more direct a new extension line is about to be constructed, commencing on the main line between Saxmundham and Darsham, running in a south-easterly direction to Southwold and Lowestoft, both places forming, when the line is completed, integral parts of the company's London, Colchester, and Ipswich section. Clacton is also expanding at a remarkably rapid rate, some hundreds of houses having been erected within the last twelve months, and we learn that it is the intention of the railway company to double the single line between Colchester and that town, as well as the present single line between Saxmundham and Aldeburgh. It may be added that the company's extension to Southend, which commences between the Brentwood and Ingatestone stations, is expected to be ready for opening at the commencement of the new year. The station buildings at the junction, which consist of two spacious structures on each side of the line, have already been completed.

OBITUARY.

Mr. J. Tom Burgess, F.S.A.—We record with regret the death of Mr. J. Tom Burgess, F.S.A., which occurred at Leamington on the 4th inst., after a long and painful illness. Mr. Burgess was born at Cheshunt, in Hertfordshire, in 1828, and became reporter on the *Leicester Journal*, when he was sixteen. Subsequently he went to London to study art. From there he went to Bonmahon, in Ireland, to help to establish some printing schools. Afterwards he was for six years editor of the *Clare Journal*, seven years editor of the *Bury Guardian*, thirteen years editor of the *Leamington Courier*, and four years editor of *Berrow's Worcester Journal*. His great love was antiquarian lore. He was author of "English Wild Flowers," which has passed through seven editions; "The Last Battle of the Roses," "Historic Warwickshire," "Fortifications of Warwick," of a paper on "The Earthworks of Kenilworth," and of a "Handbook to Worcester Cathedral." He was an occasional contributor to many other journals, periodicals, and magazines (to our own columns included), and was a most genial and helpful companion on an archæological excursion.

Mr. E. W. Godwin, F.S.A.—The *Times* of the 14th inst. announces the death, on the 6th inst., at Great College-street, Westminster, of Mr. E. W. Godwin, F.S.A.

THE FLOOR OF ST. MARK'S, VENICE.

SIR,—As the persistent fiction ascribing to symbolism the surface-undulations in the floor of St. Mark's, Venice, has lately reappeared, with variations by the Society for the Protection of Ancient Buildings, it may be alike instructive and conclusive to note the genesis of the legend, and on such ground to test its validity. In the year 1854 the late Mr. G. E. Street made his first journey to Venice. In the year following he published his "Brick and Marble Architecture in Italy," in which were recorded the impressions he received in the visit.

In this account his enthusiasm knew no bounds. Ruskin was followed and out-Ruskined. The author of "The Stones" and "The Seven Lamps" had seen nothing in the unevenness of the pavement to call forth special remark. This feature, however, before which Ruskin had kept his head cool, provoked Street to helpless rhapsody, which found vent as follows:—

"Of all the features of this very noble interior, that which, next to the gorgeous colour of the mosaics on the walls most attracted me was the wild beauty of the pavement, for I know no other word that quite describes the effect it produces. It is throughout the whole church arranged in beautiful geometrical patterns just like those of the noble Italian pavement in the choir of Westminster Abbey, but these, instead of being level and even, swell up and down as though they were petrified waves of the sea, on which those who embark in the ship of the church may kneel with safety, their undulating surface serving only to remind them of the stormy seas of life, and of the sea washing the walls of the streets and the houses throughout the city."

There was at the time a good deal of amusement at this apparent satire on the emotional interpretation of symbolism, then epidemic; but the tone of the whole book showed that the effusion was seriously meant.

A second edition of the work, published some twenty years after, removed all doubt on the point, for in this we find its author deliberately endorsing his youthful imaginings, saying, "the corresponding example of Sta. Sophia, Constantinople, where we have it on record that there was just such a floor, is conclusive as to to the intention of its imitators here." Still later, 1880, when writing in support of his idea to the *Pall Mall Gazette*, he said:—

"I remember how we are told that when the pavement of Sta. Sophia was laid it was made in the form of a central sea, from which the four rivers of Paradise flowed forth on all sides; and I ask myself why if this symbolism might be avowed in the mother church at Constantinople it might not be still indulged in in the daughter church at Venice"?

The question, therefore, thus put, in reference to St. Mark's, stands or falls by reference to Sta. Sophia.

We have seen the statements, "*we have it on record*," and "*I remember how we are told*," and may note the absence of a word of corroborative reference as to where is the record or by whom it is told. It is, moreover, not in evidence that Street ever was at Constantinople, there to form his own opinion on the spot. On the other hand, there is circumstantial reason to conclude that the fiction which possessed him in reference to the waviness of the floor of St. Mark's

was based on a strained reading of an unwarrantable description of the pavement of Sta. Sophia, current in a traveller's Handbook for Turkey, published at the date of Street's visit to Venice. In this handbook reference was made to the pavement of Sta. Sophia, in the following description:—

"The floor was originally to have been laid with plates of gold, but Justinian abandoned this idea fearing that such a step might lead his successors to destroy the work altogether. The ground was, therefore, paved with variegated marble whose wavy lines imitated the advance of the sea, so that from the four corners of the Temple the apparently waving marble flood rolled onwards into the four vestibules like the four rivers of Paradise."

It will be remarked that the hand-book description by no means justified a conclusion that there were surface undulations at all in the floor of Sta Sophia. The publishers of the Guide, however, discovered, meanwhile, that the writer of the description had drawn wholly on his imagination for his facts, and so had betrayed their confidence; as a consequence this description was at once and *in toto* expunged from the following and all subsequent editions.

According to recent communications in the *Times* from Venice, The Society for the Protection of Ancient Buildings has adopted the doctrine of symbolism by surface undulations in floors. In this spirit they are said to have discovered that the undulations in St. Mark's mean not "the stormy seas of life" nor the "ship of the church," but that "Venice rules the waves."

May not these conflicting interpretations,—the outcome of a guide-book fiction,—be left to destroy each other?

Outside of St. Mark's, in the Piazza, as in both the Piazzetta and the Piazza dei Leoni, there are pronounced undulations, and many of them in the common flag stone paving of modern times. Will no poet of symbolism, or member of the society referred to, propound a deep symbolism here? If not, I would ask why not?

DELTA.

October 13, 1886.

"FEDERATION OF ARCHITECTS."

SIR,—Having received a circular headed as above, which circular has, I believe, been sent to architects generally, I found it in the following paragraph:—

"The committee thus formed represent all existing Societies, as well as those who hitherto have practised independently."

I thereupon wrote to the honorary secretary of the "Central Committee" asking him to inform me of "the way in which the Royal Institute of British Architects and the Architectural Association of London are represented on the Committee," feeling pretty sure that no such representation existed, as I have since ascertained to be the case.

Mr. Farman replies admitting that this is so, but referring me to the previous paragraph as showing that "on the Federation Committee are to be found members of the various Architectural Societies of the Kingdom, and not that they are official representatives of such."

If your readers will refer to the circular, they will find that this paragraph in no way fulfils that description. What it does say is that at a conference, to which the circular alludes, consisting of a large number of architects and engineers from all parts of the kingdom, "representative of *nearly* all the societies, both metropolitan and provincial," certain resolutions were passed. There is not a phrase in this circular to indicate the fact that the persons so attending represented only themselves; but, on the contrary, the circular is so composed as to convey the impression that the "central" committee issuing it is the creation of *all* the existing architectural societies, as well as of architects who do not belong to any society.

It appears highly important that statements so misleading should be promptly contradicted.

THOS. BLASHILL.

SIR,—Referring to a circular signed by Mr. Roumieu Gough and Mr. Edgar Farman on behalf of "The Central Architectural Federation Committee,"—which I have received, and which has, I believe, been issued generally to members of the architectural and civil engineering professions, I think, in the interests of all concerned, that the members of those professions should be officially and publicly informed as to who are the gentlemen who have actually *served* on this committee.

The circular ostensibly emanates from "The Federation Committee elected at the Conference on this great question held in London in April last," but if rumour doth not lie, many of the well-known men who were then nominated and appointed (some without their knowledge or consent) declined to serve on the committee.

If rumour be incorrect, it would be well to have it officially contradicted, for doubtless there are many like myself who hesitate to place this important object in the hands of a committee who are not so "representative" as they seem. I enclose my card.

QUERY.

October 12th, 1886.

THE ARCHITECTURAL ASSOCIATION

CONVERSAZIONE.

SIR,—The principal objects of the opening *conversazione* of the Architectural Association used to be:—(1) The delivery of a short address followed by some remarks from the leading members of the profession; (2) The distribution of prizes to successful students; (3) Friendly communication and introductions between members of the Association, their friends, relations, and guests; and (4) The inspection of the prize drawings and others, as well as various objects of manufacture collected together for the purpose of being seen.

I am not sure yet that the total omission of the two first objects is an advantage. I am quite certain that the arrangements made by the committee for last Friday were fatal to the two latter objects. There was no time to look at anything before or after the concert and dramatic sketch,—unless one came very early or went very late. At 8·30 the guests began to take their seats, and most of them left after the performance at 10·30, or thereabouts. Those who attempted to look through the prize-drawings and others upstairs in the Institute Room found themselves outside the gallery where the performance was going on, and unable therefore to hear any of it, or to exchange greetings with their friends.

Of course I may be old-fashioned in my views, but I should like to know what is the feeling of the members on this point.

AN OLD MEMBER OF THE ARCHITECTURAL ASSOCIATION.

SCULPTURED STONES AT ST. NICHOLAS, IPSWICH.

SIR,—With reference to the notice published in your issue of October 2nd [p. 478], of some old sculptured stones in the Church of St. Nicholas, Ipswich, will you allow me to suggest that "Ostolus" may, perhaps, be part of the word "Apostolus" (Apostle).* The A and P might have been on the short arms of the cross. I notice in the same figure what seems to be a hand grasping some object; if the nature of this object is ascertainable, this might supply a clue to the name of the Apostle represented.

It would be interesting to know what exactly is the inscription with reference to St. Michael.

Is it quite certain that the figure in the tympanum is a boar? In East Anglia the wolf is an important animal as figuring in the legend of St. Edmund.

F. HERVEY.

3, *Spring Gardens*, Oct. 7th.

ST. IGNATIUS, R.C. CHURCH, PRESTON.

SIR,—May I ask you to correct a mistake which occurs in the description of the Church of St. Ignatius, Preston, as enlarged by my friend, Mr. C. Hadfield? This church, which is a very interesting specimen of the early "Revival," was designed in 1835 by my old master, the late Joseph John Scoles. His son, Ignatius, who for some years studied architecture, is, I am happy to say, not to be described as "the late," as he is now a missionary priest in British Guiana, where his artistic and constructional knowledge has served him to good purpose.

S. J. NICHOLL.

RAILWAY RATES.

SIR,—Any legislation with regard to the above will be useless unless it includes compelling the companies to carry all goods, except such as are dangerous. It is this power of refusing to carry goods which paralyses all efforts at reform. The existing law is quite sufficient to deal with the question of unfair advantage to the foreign importer. The courts will not take into consideration the question of competition in determining rates. The obstacle in the way of putting a stop to unfair advantage is the great cost of legal proceedings, as in the case of the manure from Aberdeen, the costs of the decision in which were 2,500*l.* Added to this is the power the companies have of retaliating upon and annoying a trader. Refusing to carry a particular kind of goods may be a small matter to a railway company, while to a trader the effect is ruin.

C.

* We regarded the conclusion as too self-evident to need comment.—ED.

AUTOMATIC COUPLINGS.

SIR,—In your issue of July 17th [p. 85], in an article on the Machinery at the Colonial and Indian Exhibition, you have been kind enough to notice the patent rails and trucks fitted with automatic couplings, both being patents of Messrs. Cowdery & Thomas, of Sydney, New South Wales, for which notice we beg to thank you.

From your remarks on these patents you appear to think they are new patents that have not borne sufficient tests, and therefore write of them as doubtful in their working. In explanation, allow me to state that the patent couplings have been working on the New South Wales railways since February, 1881, and have acted perfectly in all respects. They have been tested in the severest manner. Both of the inventors are railway engineers of over thirty years' experience, and would scarcely have overlooked such an important point in a coupling as the difference of load in trucks freighted and empty. The tests they have been subjected to, in difference of load, have been more severe than any traffic officer would allow, and yet, have not proved any uncertainty of coupling. The adjustable links are arranged for the extreme of difference in load between all trucks used, either loaded or empty.

To have worked upon our railways for the time specified, without accident through their use, is a guarantee of their value. Our mountain lines have been traversed by trucks fitted with these couplings, and with all conditions of loading.

Our lines are much more severe as regards curves and gradients than those in England of the same gauge, our gauge being 4 ft. 8½ in. We have reverse curves of 7, 8, and 10 chains radius, and gradients of 1 in 30, often for three miles in length.

The rails have been laid here on a portion of the line that has the heaviest traffic, and have answered all the conditions claimed for them, with the exception of the length of "life." This will take, as far as we can see, many years to decide the percentage of saving. We have proved that they can be laid in half the time and labour of any rails at present in use. The joints keep free from jumping or any permanent set, while the "gauge" remains perfect, reducing the tendency to oscillation to the minimum.

EDWIN R. THOMAS,
For Messrs. Cowdery & Thomas.

Department of Public Works,
Railway Branch, Sydney, N.S.W.,
September 1st, 1886.

NEW WAREHOUSES, ST. PAUL'S CHURCHYARD.

SIR,—As the equivocal wording of the second paragraph of your description [p. 518, *ante*] of Mr. Hemings' buildings is likely to give the impression that that gentleman was also concerned for the adjoining warehouses, I should feel obliged if you would allow me to state that I was the architect of the six warehouses north of the three which Mr. Hemings designed, and which, in your perspective, are ingeniously hidden by the Cathedral.

DELISSA JOSEPH.

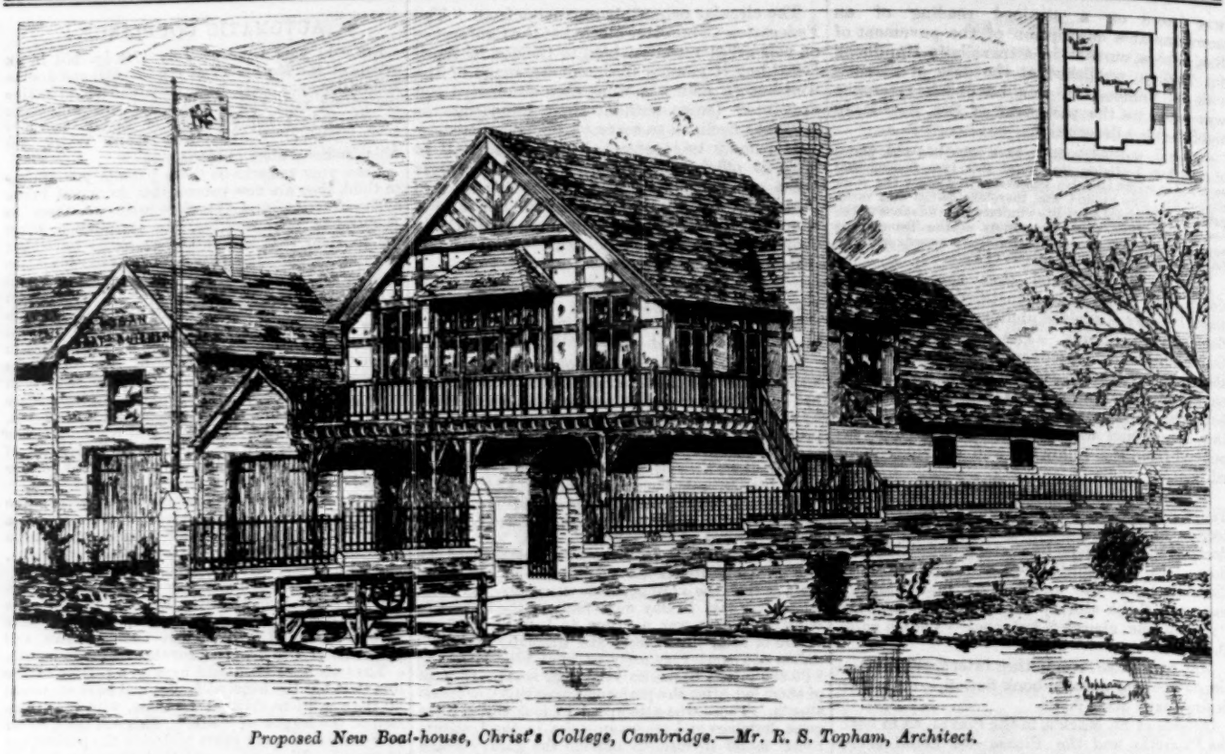
** There is no "ingenuity" in the matter; Mr. Hemings brought us a drawing showing the whole block of warehouses, which could only be done by falsifying the facts and representing the street as widened; and as that is exactly what ought to have been done and never was done, and as the matter has been the subject of much public discussion, we declined to publish a falsified view. If our correspondent wants his end of the new buildings illustrated, he had better send us an equally good drawing from the other side of the site.

A CEMENT QUERY.

SIR,—Can you, or any of your correspondents, inform me by what means the running of liquid cement can be removed from slates?

A CONSTANT READER.

Hot-Water Spring at Buda-Pesth.—Some interesting experiments are being made at Buda-Pesth in obtaining a hot-water supply for the town from a natural hot-water spring. An artesian well has been bored by two Hungarian engineers to a depth of about 3,500 ft., being most probably the deepest in the world. From this a supply of hot water amounting to some 150,000 gallons per diem is obtained, having a temperature 35 ft. above the ground of 70° C. It is the intention to continue the boring, the city authorities having granted a sum of 200,000*l.* towards the undertaking until the temperature reaches 80°, a temperature which it is expected will soon be reached, as it increases with the depth. It is anticipated that the supply of hot water will be sufficient for the whole town, and may contribute to the cultivation of tropical plants in the neighbourhood.



Proposed New Boat-house, Christ's College, Cambridge.—Mr. R. S. Topham, Architect.

NEW BOAT-HOUSE, CHRIST'S COLLEGE, CAMBRIDGE.

The site, together with the adjoining boat-shed, has been purchased from Mr. Logan; it occupies the corner of his boat-yard next the road. At present there is on the site an old boat-shed, which it is intended to pull down, and make use of some of the materials in the new building. The ground-floor is to be occupied by a boat-shed and workshop.

The building is to be constructed of red bricks up to the first-floor joists, half-timbered work above, and the roof covered with red tiles. Tenders have been received from local builders varying from 700*l.* to about 600*l.*, and the work is to be commenced next term. The architect is Mr. R. S. Topham, who is now in residence at the college.

The Student's Column.

STONE QUARRIES.—XVI.

KIRKCUDBRIGHTSHIRE GRANITES.

THERE is plenty of granite in this county. The three principal districts where it is found are, that in the north-west, extending from Loch Dee to Loch Doon; the second, stretching from Loch Ken to Palnure Water; and the third, from Criffel to Craignair. It is a noteworthy fact that, although its existence was known a long time ago, the principal houses and gentlemen's residences were, in the early part of the present century, almost exclusively built of old red sandstone from Dumfries-shire. And Mr. David Bremner, in his "Industries of Scotland," informs us that, when the bridge over the Dee at Tongland was built, in the years 1804–5–6, after a plan by Mr. Telford, the celebrated engineer, at a cost of nearly 7,000*l.*, it appears never to have entered the mind of any one concerned in the matter, to utilise the granite boulders close by, so that the stones used in the structure were transported, at great expense, from the island of Arran, and they were subject to heavy duty, which greatly added to the cost.

Granite was, however, used at Dalbeattie for some years previously, but it was not until 1825 that anything like extensive operations in the working of granite were commenced in the district. In that year, the Liverpool Dock Trustees leased a portion of Craignair Hill, near Dalbeattie, for the purpose of obtaining material for the construction of the docks. This was attended with great success; so much so, that other enterprising spirits took the matter up after the Dock authorities had finished their work. Several quarries were opened in addition, and a brisk trade was carried on for a long time, not only with the United Kingdom, but with Russia, several Mediterranean ports, and South America.

We may mention that in some of the quarries in the parish of Kirkmabreck the stone was worked without blasting.

Several of the quarries opened have, for various reasons, been closed, but the excellent material which is found near Dalbeattie is still worked and polished on an extensive scale in that town. All the granite, as far as we are aware, is of a grey colour.

Dalbeattie Quarries.—The light grey stone obtained from these quarries is fine-grained,—some kinds approaching medium. The quartz is white, clear, and transparent. The felspar is mostly white also, but here and there assumes a light-brown tint. None of the crystals are well defined, and they are much interlocked with the quartz. There is a fair proportion of black mica present, and another black mineral, which occurs in long needle-like crystals, denotes the presence, perhaps, of schorl. This last mineral is not too abundant.

The stone appears to be very hard, compact, and takes a beautiful polish, being highly suitable for ornamental decorations and the like. Besides being used in Liverpool, it may be found in the Newport, Birkenhead, and Swansea Docks, and several public buildings in Manchester and other large towns in the north-west of England.

Creetown Quarries.—These are near Newton Stewart, and are sometimes known as the "Globe" quarries. The stone is very similar to that lastly described, and it bears a great resemblance to certain kinds of Newry granite. It does not, however, contain much of the light brown felspar.

It was extensively used in the Liverpool docks.

The stone obtained from the *Rockcliffe Quarry* is much darker than either of the other Kirkcudbright granites described. This is principally owing to the greater abundance of the black mica. It is fine-grained, and the white felspar and quartz are with difficulty separated from each other.

ARGYLESHIRE GRANITES.

The granite industry in this county is largely,—almost exclusively,—confined to quarrying only, the stone being sent elsewhere to be polished or elaborately worked into monuments, &c. Quarries are scattered about in various places, such as at Inverary, Oban, Strontian, Loch Awe, and the Ross of Mull. We will first deal with the

Ross of Mull Quarries.—The Isle of Mull contains a considerable quantity of granite. Much of it is found in the centre of the island, where it is cut up by great masses of an equally crystalline rock—gabbro, which has formed subsequently to the granite. It would appear from the researches, principally of Professor Judd, that these highly crystalline rocks are the stump of an ancient volcano, and the greater part of the island is described as the basal wreck of a volcano. The lavas, which surround these central masses, bear a close relationship to the granites and gabbros alluded to, and, like them, they can be shown to have formed at least two different periods. This volcano was in eruption in very early tertiary times, as has recently been shown by Mr. Starkie Gardner, from a critical study of the fossil plants found imbedded in rocks between the sheets of basalt,—the most recent lava erupted.

It appears that the granites, &c., in the interior of the island are not used to any extent for commercial purposes, but that quarrying operations are chiefly confined to the extremity of the south-western part of it, known as the Ross of Mull.

The granite at this place has no connexion with the central masses; neither has it anything to do with the volcano. It is simply a part of the groundwork upon which the volcano was built, and is thus of much more ancient formation.

The rock has been extensively quarried from time to time, by some of our greatest granite merchants; but it does not seem to have been worked in a steady systematic manner for any long consecutive periods, such as have the majority of the other rocks described. People seem to have procured the stone only when large contracts required it. Why this should be the case is difficult to understand, for the rock, when polished, is exceedingly handsome, much more so than many of those that find their way in large quantities into the market. The opinion we thus express regarding the Ross of Mull granite is shared by all architects who know the stone, by whom it is much sought after. One would imagine that the supply had fallen short of the demand, if it could not be easily shown that this is not the case. Very large blocks are obtainable, and the supply is almost inexhaustible. We are informed by one of the quarriers that the principal cause of the trade being so disproportionate to the beauty of the stone is a lack of the "sinews of war," and quite recently he has had to decline some large orders solely on this account. The fact that Mull is a rather out-of-the-way place has, however, no doubt a great deal to do with it.

On the contrary, a good trade is done by the chief of the Shap quarries, Westmoreland, in

bringing the Mull granite by sea and rail to that place to be worked and polished, and, as we have previously pointed out, the tremendous columns at Blackfriars Bridge were so treated. But we should like to see the Mull quarries more fully developed, and more machinery would then be erected for treating the material economically on the spot than is now the case.

Speaking of the stone itself, it is of a warm red colour, brought about principally by the presence of a large proportion of red orthoclase felspar, which, although occurring as masses of crystals congregated together, have no definite outline, their edges presenting a ragged appearance and dovetailing into the other minerals in such a manner as to cause the stone to have no marked grain, other than that always more or less exhibited in this class of rock, and found out only by the manipulators. White felspar is also exhibited. The quartz is clear and transparent, and occurs in tolerably regular crystals, whilst the black biotite mica is not very abundant. Two or three accessory minerals are present, but do not affect the general structure of the stone, which is coarse-grained.

Examples of the Ross of Mull granite may be seen at Westminster and Blackfriars bridges, Holborn Viaduct, &c., in London; St. George's Hall, and in the Docks, at Liverpool; several public buildings in Manchester, where the polished work is now being used; and in some docks and lighthouses in the north-west of England and south of Scotland.

Loch Awe Quarries.—These quarries are situated at the head of Loch Awe, in the base of Ben Cruachan, and about three miles from Loch Awe station, being connected with the Callander and Oban Railway by a branch line belonging to the quarry-owners. At present there are two workings opened, one being 300 ft. above the other. The branch line comes into the lower quarry, being about a mile and three-quarters in length, with a gradient of one in fifteen to two in thirty. The upper quarry is connected with this by a drum tramway.

There are two different kinds of stone, one being grey and the other a dark grey, speckled black. The former is found in the lower quarry, and when it is properly opened up a great quantity of large stones for monumental and other purposes will be raised. The dark stone is obtained from the upper quarry, where there is a very large face of granite, capable of being opened up to the extent of about three hundred yards. It is suitable for either monumental or dock work; at the present time some large blocks are being cup up for the former purposes, and the polished stone is becoming a marked feature in the yards of the Aberdeen granite-workers, where it is finished.

Mineralogically, the stone is principally composed of quartz, felspar, mica, and schorl. All the minerals are thoroughly interlocked with one another, and none of them have had space enough to crystallise regularly. This shows that they crystallised out almost simultaneously, and it gives a very characteristic appearance to the stone. The quartz is white and crystalline, being much broken up; the felspars are of three tints, milky white, light green, and light pink. The other minerals are black. It is fine-grained.

Arran granite does not appear to be worked on a very extensive scale. There are many large boulders, from half a ton to a ton in weight, in the vicinity of Sannox which are split and used in mills. Goat Fell, with an elevation of 2,875 ft., is composed principally of granite of two varieties, the coarse-grained and the fine-grained, formed probably at successive periods. In composition, however, they are similar, being formed of white orthoclase, a triclinic felspar probably oligoclase, quartz, and a little black mica; the quartz is very abundant.*

Strontian granite is medium-grained, of a grey tint, consisting of quartz, oligoclase white felspar, and black mica in abundance.†

The Constitutional Club.—We may add to our description of the Constitutional Club in last week's issue, mention of the fact that about 1,000 ft. super. of Hayward's patent "semi-prismatic pavement lights," supplied by Messrs. Hayward Brothers & Eckstein, of Union-street, Borough, have been fixed, some 3 ft. wide, all along the front.

* Hull's "Building and Ornamental Stones," p. 34.
† British Association Report, 1863, p. 62.

Books.

Electric Transmission of Energy and its Transformation, Subdivision, and Distribution. A Practical Handbook. By Gisbert Kapp, C.E. London: Whittaker & Co. and George Bell & Sons. 1886.

It has been stated that an eminent scientist, upon being asked what was the greatest invention of recent years, replied "the discovery that the Gramme machine is reversible." This means that whereas the dynamo machine was originally invented for the purpose of converting mechanical energy into an electric current by causing coils of wire to revolve between the poles of a magnet, the same electric current if obtained from any extraneous source,—whether a primary battery or another dynamo machine,—can be reconverted into mechanical energy and itself cause the revolution of the original coils and consequently do useful work. It is probable that this discovery, like so many others, was made quite accidentally at the Vienna Exhibition by a workman who inadvertently connected two wires through which an electric current was passing with a dynamo which was at rest, when it was instantly set in motion. Whether the discovery was accidental or not there can be no doubt that it opened up an entirely new field to inventors, and it is somewhat surprising that greater progress has not been made in developing the practical transmission of power by electricity. The probability is that the transformation of the electric current into light appealed more directly to the public mind, and hence inventors bent their whole energies in this direction. As the author very justly says, the dynamo as motor, has been comparatively neglected for the dynamo as generator. Its capabilities in the former capacity are now, however, becoming gradually recognised, more particularly for the purpose of supplying power in small quantities, and for obtaining high speeds. In conjunction with this, there is the great advantage of economy of space and weight in the motor itself.

The work under notice treats the whole subject most thoroughly. The theory of the transmission of power is worked out clearly and fully, and formulæ are given from which the mechanical energy which the receiver will give out can be calculated from that supplied to the generator under various conditions of speed, resistance, &c., and the graphical solution of the problems involved, which Prof. Sylvanus Thompson was the first to suggest is explained. Moreover, the author, who has great practical experience as well as theoretic knowledge, never shirks hard facts, and he not only points out various instances in which practical results differ from those deduced theoretically, but explains the reason of the variations which occur. Perhaps the most important practical questions discussed are (1) the relation between the maximum mechanical energy of a motor and its weight, and (2) the most economical size of conductors. We have not space to follow the author into his discussion of the comparative merits of the various kinds of dynamo machines as motors, nor into the very interesting comparison of the relative cost of power transmitted in different ways, but the general conclusions arrived at, based on the estimates of Herr Beringer in his work on this subject* are sufficiently interesting to be quoted. "1. It pays to transmit cheap water power: by wire rope if the distance is less than a mile, and electrically if the distance is a mile or more. This applies to all powers. 2. It pays to transmit cheap steam power if the amount of energy required at the receiving station does not exceed 10-horse power. If the distance is less than a mile use wire rope; for distances of from one to three miles use electric transmission. Beyond this limit a small local steam or gas engine is preferable." The work concludes with a short description of the various practical installations of electric transmission which have been inaugurated. We cannot resist the conclusion that very great difficulties still remain to be overcome before the electric current can be used on any large scale to transmit energy, and Mr. Kapp wisely does not attempt to shirk their difficulties, but the publication of such a work as this will prove of immense help in overcoming them, as it appears to us to be thoroughly well and carefully prepared, and we are sure it will be of the greatest possible value to engineers. We do not know whether we shall have to submit to what must now be called the "authorised" form of spelling *centimeter, kilogram*, &c., but we can only say that we dislike it intensely.

* Kritische Vergleichung der Elektrischen Kraftübertragung. Berlin. 1883.

Arc and Glow Lamps: a Practical Treatise on Electric Lighting. By Julius Maier, Ph.D. London: Whittaker & Co. and Geo. Bell & Sons. 1886.

It is now seven years since the Count Du Moncel published what was probably the first work devoted exclusively to electric lighting. This was a very clear and complete *résumé* of the subject, and the author described the various inventions which had been made public up to that date. But, with the exception of a somewhat sarcastic reference to the high-flown rumours which had recently reached Europe of Mr. Edison's success in forming lamps in which the light was obtained by heating a platinum wire to whiteness by means of the electric current, we find no reference whatever to lighting by incandescence, the invention of which has rendered electric lighting generally practicable, as it solves the problem of the indefinite subdivision of the light. Arc lamps, however, have still an important function to fulfil, as, for certain purposes, they are more suitable and much more economical than incandescence or glow lamps, and in the work under notice will be found much useful information upon the two systems of lighting. The book is divided into four separate sections. Part I. treats of the general principles of electric lighting, the electrical units, and the efficiency of dynamos, &c. Much of the information here given partakes of the character of a twice-told tale, and we cannot help thinking that the author's statements might have been made much clearer if rather more care had been taken. For instance, in discussing the efficiency of dynamos, we are told that "*cæteris paribus*, the efficiency of the machine is higher the better its ventilation." Now, this is very loose writing: the "efficiency" of a dynamo is a perfectly well recognised term, meaning the ratio between the electrical output at the terminals and the total mechanical work put into the belt, and this depends upon the construction of the machine, varying from 0·65 in bad machines to 0·94 in very good ones. Undoubtedly the ventilation of the machine, or rather of the armature, affects the heating of the latter, and, therefore, allows it to run a longer or shorter time under a certain load; but this is not, strictly speaking, the efficiency of the machine. Further on we find the same confusion, as Dr. Maier says in speaking of a test of a certain machine that its high efficiency arose "from the arrangement of carbons in the lamp." We utterly fail to see how the "efficiency" of a dynamo can be affected by the lamp which is driven by it, and, in fact, we believe the modern practice invariably is to test most carefully the dynamo, the lamp, and the carbons separately before coming to any conclusion as to the efficiency of the first-named. In the description of instruments we notice several omissions. Messrs. Ayrton & Perry's spring ammeter and voltmeter are mentioned, but the old forms, which are no longer made are described fully and illustrated, and no mention is made of either Crompton & Kapp's instruments or Capt. Cardew's, which are the most largely used now. Edison's current meter is described, but Ferranti's is omitted.

Part II. consists of a description of the best known types of arc lamps, but we do not think the author lays sufficient stress upon the degree to which all arc lamps are dependent upon good carbons. The unsteadiness which is so frequent an accompaniment of arc lamps is far more often due to differences of density in the carbons and other defects of manufacture than to defects in the lamp itself, and we think it would only have been fair to point this out. We notice descriptions of several lamps which, whatever may have been their merit, have not been found to be of practical use, and even in the description of some of those which are largely used, such as Crompton's, we find no mention of the latest form of this lamp, and we believe the only pattern which has been in use for the last three years. We are thus driven to the conclusion that Parts I. and II. of this book were written some time ago, and that the author's engagements have not permitted him to revise

them, and bring the information given up to date. We regret this all the more, because Part III. of the book, which is concerned with glow lamps, is excellent, giving a large amount of useful and in some cases novel information. There is, however, in the table, in page 283, a curious misprint, where, at the head of one of the columns, we have "Resistance in Ohms (Holt)," this last word should be "hot," the resistance of the filament always being taken when it is heated by the current. Some interesting tests are recorded of lamps whose carbon filaments have been flashed,—that is, treated with some hydro carbon,—so that there ensues a deposition of carbon on the filament, and the results tend to show that this flashing of the filament has the effect of maintaining its efficiency for a longer period than would otherwise be the case. The work concludes with a short chapter on the various applications of the electric light. We notice that this book is one of what is called "the specialists' series," and although we take leave to doubt whether specialists will find in it all the information and assistance which they may expect from its title, we have no hesitation in recommending it to architects and others who ought to have some knowledge of the practical part of electric-light engineering.

The Gas Engineer's Chemical Manual. By J. Alfred Wanklyn. London: Scientific Publishing Company, Limited, 22, Buckingham-street, Strand, W.C. 1886.

This work is a small one of 74 pages on a subject of considerable magnitude and importance. The author's name is sufficient guarantee of the practical nature and value of much of the information given. The book is likely to be useful to managers of small and medium-sized works, with whom, as a rule, the more elaborate and ponderous text-books on gas analysis find but little favour.

Bearing in mind the intention and scope of the work, exception must be taken to the rather perfunctory manner in which the reader is referred on page 32 to a certain work of the author's on water analysis for further information as to the mode of Nesslerisation in the estimation of ammonia in coal gas. The obviously unnecessary remark in the same connexion that the process of Nesslerisation is quite familiar to chemists, is entirely out of place in a manual for gas engineers, and rather apt to suggest the undesirable inference that the object of the author is to stimulate by a side wind the sale of a totally unconnected work.

The frequent references to Cooper's coal-liming process, whereby it is claimed that sulphur compounds can be completely, or at any rate to a much larger extent than is at present the case, eliminated from the gas, indicate that this promising but not as yet very widely adopted patent finds in the author an ardent advocate; indeed, the work seems to have been written largely with the idea of furthering its interests.

Among the advantages which are incidentally referred to we may notice the statement that the resulting coke is more readily combustible than the ordinary article, and that, as the sulphur is fixed by the lime, the production of the unpleasant and injurious sulphurous fumes is avoided. On the other hand, it is quite certain that the addition of lime must seriously increase the percentage of ash and the larger works would lose considerably by the diminished demand, which would surely result, for such lime-laden coke, as well as by the extinction of income which is at present derived from the sale of the sulphur contained in spent oxide, whilst it would seem to be an open question as to whether the increased amount of ammonia obtained would cover these losses.

Shareholders and proprietors of gasworks might also object to the cost of the necessary manipulation of the coal previous to carbonisation (breaking up, mixing with lime, &c.), especially as the yield of gas seems to be somewhat diminished, owing to the lowering of the temperature of the retorts, in consequence of the presence of moisture. No information is given in this work as to the effect of the moisture of the slaked lime upon the quantity of the extremely poisonous carbonic oxide in the gas made by the Cooper process. It is well known that the action of steam upon incandescent carbon is to produce a large proportion of carbonic oxide, so that the point is an important one.

If it be possible by liming the coal to economically remove the sulphur compounds, to a much greater extent than is possible by the usual processes, without at the same time increasing the amount of carbonic oxide, the experiment deserves to be more widely tried, and subsidiary objections may be overlooked in view of the important advantages to be derived from the use of sulphur-free (or nearly free) illuminating gas. Certain gas engineers have ventured at various times to assert that the sulphur compounds which result from burning ordinary coal gas are harmless, or nearly so,—an assertion ludicrously at variance with the practical experience of less directly interested observers, which has proved beyond a doubt that these sulphur products are a sadly too frequent cause of the rapid deterioration of the materials, pigments, &c., used by decorative artists.

We sincerely hope, then, in the interests of all lovers of beautiful interiors, where the use of gas is at present unavoidable, that the following paragraph, which is the concluding one of the book, gives expression to a practical possibility and not merely to the enthusiastic opinion of a presumably interested advocate:—"If coal-liming were perfectly carried out, the gas passing up the ascension-pipe out of the retort would be quite free from sulphur in every shape; and when coal-liming is practised even imperfectly, the work to be done by the purifying boxes is reduced to a minimum."

The work is clearly printed, well arranged, and written in the author's usual forcible and direct style. Typographical errors are few and unimportant. On p. 43, and in the index, cresylic acid is incorrectly spelt cressylic acid.

The Techno-Chemical Receipt Book. Edited chiefly from the German of Drs. Winckler, Elsner, Heintze, Mierzinski, Jacobson, Koller, and Heinzerling, with additions by Wm. T. Brannt and Wm. H. Wahl. London: Sampson Low, Marston, & Co., 188, Fleet-street. Philadelphia: Henry Carey, Baird, & Co., 810, Walnut-street. 1886.

This is a compendious and handy volume of 460 pages closely printed in double columns, and worthy of a place alongside "Cooley's Cyclopædia of Practical Receipts."

So far as we have been able to test it, the information given, embracing a bewildering variety of subjects, is clear, concise, and as a rule accurate, though, as might be expected from such a work, there are not a few errors of diction, spelling, and nomenclature. As an illustration of the latter we may quote a receipt on p. 178 for a substitute for opaque glass, which recommends among the other ingredients hydrochlorate of baryta, an obsolete term describing the well-known salt chloride of barium; a more serious slip has been made in the second part of the same receipt, where sulphate of baryta is referred to instead of the obviously intended soda salt; such a mistake as this will lead any one without chemical knowledge hopelessly astray.

Under the head of "Building Materials, Artificial Stone, &c.," much practical and serviceable information is given, and we especially commend the following remarks to the attention of all "whom it may concern," to use an old-fashioned formula:—"To obtain good mortar, as much depends on the character of the ingredients and the manner of mixing them, as on the quality of the lime. It does not necessarily follow that because a lime is good the quality of the mortar will be good also. *The best lime ever burned would be spoiled by the custom common among some builders of mixing it with earth and rubbish taken from the foundations of intended buildings.*" The italics are our own. Receipts for rendering wood incombustible and for its preservation are scattered through the work. It would certainly have been better to have grouped them together under the heading of "Wood," where several receipts will be found, though the inconvenience of the present arrangement is greatly lessened by the very excellent index appended to the work.

Under the heading above referred to, much valuable information is given concerning the gilding, polishing, staining, preservation, and seasoning of wood, although as regards the last item we must express our scepticism respecting the allegation that green wood can be freed from moisture and rendered fit to work, in from ten to fourteen days, by merely being imbedded for that length of time in animal charcoal, bone black, or peat dust. Our countryman, Mr. S. B. Boulton, also, will be interested to learn that a process for creosoting timber, which, if we are not very much mistaken, is in all essential details similar to the one patented by him some years ago, is described here by the compilers as an American invention.

To render brickwork impervious to water, Sylvester's process, used with much success in America, is recommended. This consists in the successive application to the walls of two washes, the first being composed of Castile soap and water, and the second of alum and water. The action is, of course, to close the pores of the brickwork with the insoluble oleate of alumina which results from the action of the alum upon the soap solution, and when applied in the way directed it is stated that four coatings will render a reservoir free from leakage under 40 ft. head.

Under the heading of Cements, Pastes, and Putties some excellent recipes are given. Lacquers and varnishes have twelve pages devoted to them, many of the recipes being of a valuable character, though we must again take exception to a piece of antiquated phraseology, in this instance adopted in the case of ordinary ammonia solution, which is described on page 208 as "spirit of sal-ammoniac."

In conclusion, we can commend the volume as a really useful one, though a re-arrangement of some of the matter, careful revision of the whole, and the modernising of a good deal of the nomenclature, will greatly enhance the value of any subsequent edition.

Kelly's Directory of the Building Trades. Fifth Edition. London: Kelly & Co., Great Queen-street. 1886.

This useful directory has again made its appearance. While commending it to our readers as very fairly professing to comprise "every trade and profession connected with architecture and building throughout England, Scotland, and Wales," we yet feel constrained to point out that in some respects it is not so complete as it might be. To particularise a few points, the list of county surveyors exhibits some omissions; the list of officers and Council of the Royal Institute of British Architects is not up to date; the list of architectural lithographers is incomplete; and in some cases prominent names which ought to be included under provincial towns are not there. We venture to suggest to the publishers that the usefulness of this work would be greatly added to if they would include in future issues some particulars as to the various charities connected with the building trades; a list of the Master Builders' Associations and their secretaries; a list of the London and provincial architectural societies; and some information as to the trade-union organisations connected with building operations, such as those of the stonemasons, bricklayers, carpenters and joiners, plumbers, painters, ironfounders, &c. For convenience of reference, all these items of information should be tabulated in collective form at the commencement of the Directory, along with the lists of borough and county surveyors; but they should also appear again, dispersed under the headings of the various towns to which they appertain, in the body of the work,—so that under each town might be given a complete conspectus of all that concerned the building trade of that town. We trust to see some or all of these suggestions adopted in future issues of this now indispensable work of reference.

VARIORUM.

"The Timber Trades' Directory" (London: W. Rider & Son, Bartholomew Close) has been issued. It professes to contain "the addresses of the leading timber merchants and saw-mill owners throughout the world." The title-page (there is no preface or introduction) states that the work has been compiled by l'Administration des Annuaires d'Adresses, Paris, and the British section revised by the publishers of the *Timber Trades' Journal*, who, no doubt, have special facilities for ensuring accuracy. So far as we have been enabled to test it, the work is reliable and is sure to be useful. The foreign sections, such as French, German, and Italian, are compiled in the native languages.——"Bemrose's Railway Rate Book" (London: Bemrose & Sons), gives an alphabetical list of stations, sidings, and collieries on English railways, with ruled columns for entering rates,—a

useful memorandum-book for those largely engaged in transporting goods by rail.——"Iron-plate Weight-Tables," compiled by H. Burlinson and W. H. Simpson (Crosby Lockwood & Co.), contains over 200 pages of schedules of weights of varying lengths and thicknesses of iron plate; useful to architect, engineer, and contractor, giving the weight of any size of iron plate from 1 ft. to 10 ft. in length, from ¼ in. to 1 in. in thickness (by sixteenths of an inch), and from 6 in. to 5 ft. in width (by half inches).——Messrs. T. & W. Farmiloe, of Rochester-row, Westminster, have lately issued a very complete and well-got-up illustrated catalogue, which may be described as a veritable *vade mecum* of information about sanitary appliances and fittings, plumbing and glazing work, gasfittings, paints, varnishes, &c. It contains upwards of 850 pages, and is strongly bound for reference. It will be found useful in every builder's office.——"Walks in Epping Forest," by Percy Lindley (London: Published at 125, Fleet-street), is a cheap and very excellently-illustrated handbook to the forest-paths, with cycling and driving routes. Without vouching for its accuracy with regard to all historical and archæological points touched upon, we can unreservedly say that the visitor to the Forest will find it only second in value to Mr. E. N. Buxton's capital guide to the Forest.——We have received from the author, Mr. W. L. Kellaway, a "Description of Scheme for the Development of the Site of Coldbath Fields Prison, Clerkenwell" (published by Goode Bros., Clerkenwell-green). Mr. Kellaway proposes the formation of two new streets, running diagonally from the existing corners of the site, with a great deal of open space in the form of gardens in the centre of the site and around the points of the intersection of the streets. The blocks of artisans' dwellings which he proposes for erection are situate on the borders of the site, and provision is made in separate blocks for costermongers' dwellings and stables for their ponies and donkeys. Mr. Kellaway's suggestions are worth consideration.——The *Commercial World* (published at No. 10, Adam-street, Strand) in a recent number published a very useful table, specially compiled from Parliamentary Returns, giving a comparative view of the premium incomes of ninety-one British life insurance offices.——Messrs. F. W. Reynolds & Co., of 73, Southwark-street, have recently issued a very useful illustrated catalogue of hardware goods and general ironmongery. It contains some specialities in locks and door and window fastenings generally.——From the Index Society (6, Hanway-street, Oxford-street) we have received Part I. (A to Gi) of the "Index to the Obituary and Biographical Notices in the 'Gentleman's Magazine,' 1731-1780," by Mr. R. Henry Farrar, F.R.H.S.," which will be indispensable to explorers in that curious and interesting miscellany.——"The Tape Indicator Map of London, and Visitor's Guide" (C. Smith & Son, 63, Charing Cross) embodies an idea of great value and usefulness to the visitor or resident who is unacquainted with all parts of that vast province of houses which is called London. A tape bearing a series of numbers is strongly pivoted to one end of the map, and on the other three margins of the map is another series of numbers. The tape radiates from the pivot so as to enable it to be placed on any one of these marginal numbers. Strongly bound within the cover of the map is an alphabetical list of 7,000 streets,—this number including, of course, most of the principal streets, roads, and places in the metropolis. Opposite the name of each street is a map-number and a tape-number. By bringing the tape in a straight line across the map to the map-number, and by looking just above the tape at that part of it which bears the specified tape-number, the street of which one is in quest is at once found. But the map is scarcely large enough, and does not show sufficient of London south of the Thames. This is a defect that should be remedied in future issues.

Builders' Benevolent Institution.—The thirty-ninth annual dinner of this Institution will be held in the Hall of the Worshipful Company of Carpenters, London-wall, on Thursday, November 4th, the President of the Institution, Mr. Basil E. Peto, in the chair. We trust that the Institution will be liberally supported on this occasion.

RECENT PATENTS.

ABSTRACTS OF SPECIFICATIONS.

11,110, Pavements. J. Fabbri & Co., Praga (Cairo).

This invention relates to a pavement consisting essentially of a species of macadam wherein the sand or gravel which ordinarily binds the broken stones together in macadam is replaced by asphalt. Slabs are made also in the same manner and laid down for pavements.

11,128, Closets. C. Heywood.

The closet is insulated entirely, and a circulation of air is arranged over and under by means of the cavity which is around it. The entrance is over a grid on the floor line equal in width to the cavity on the side or end which is nearest to the entrance to the closet where it adjoins the house or passage leading to the same. The cavity at that side opens upwards between two doors. If the inner door is open the air will be carried into and ventilate the closet as well as the other cavities surrounding it; whilst, if both doors are closed, the ventilation will be confined to the cavities, and any annoyance from too much draught of air when the closet is in use will be thus avoided.

12,477, Improved Cowl or Ventilator. G. Smith.

The rotator is fixed at such an angle that the wind causes it to rotate and to actuate a fan or archimedian screw which exhausts the smoke or foul air. Above this is fixed a cowl-head kept in position against the wind by a vane or arrow, down-draught being thereby prevented.

12,700, Ventilation. J. Westmoreland.

A hollow beam is employed which has ventilating openings and a hollow tail-piece with junctions leading into chimneys or flues. The beam may be used as a trimmer, with means of securing it at each end to the flooring joists with bearings to receive the end of the joists supported by it. It may also serve as a carrier for the hearth-stone or its equivalent.

13,143, Shop Fronts. F. J. Chambers.

This patent relates to cast-iron shop-fronts, so constructed that they can be fixed up and glazed complete in a very short time. The improvements are also available on shallow sites of land without the sacrifice for constructive purposes hitherto necessary in erecting shops of this nature. The stanchions are cast hollow and without a back, but with a projecting lip on the inner surface of the sides. Wooden blocks are fixed and driven home by means of slate centre or key pieces, to be built in the party-wall where necessary. The wooden blocks being fixed, india-rubber filleting or tubing is glued or otherwise fixed to the iron or stanchion; the sheets of plate-glass are pressed home, a second india-rubber filleting is fixed against the glass, and the whole is secured by the match-boarding secured to the wooden blocks. Advertising panels, frames for stained glass, &c., are provided, and provision is also made for fire-proof partition walls between different shops in a row where brick division walls are unnecessary.

12,725, "Tie" or Interlocking Bricks. H. Blythe.

The object of this invention is to produce bricks of such a shape as to avoid side and end "straight joints," which are common when ordinary bricks are used for walls, pit-shafts, &c., and to tie the work. The bricks have a lug or projection near the centre of one side, the other side of the brick being suitably recessed to receive the lug of another brick. The bricks are of variable shapes and patterns, all tending to the same end.

NEW APPLICATIONS FOR PATENTS.

Oct. 1.—12,643, F. Frouvay, Saws.—12,464, W. Kinipple, Construction of Breakwaters, Harbours, Docks, Quay Walls, &c.—12,470, E. Long, Concrete Blocks.

Oct. 2.—12,492, W. Wood and A. Simmons, Imitation of Stones on Wood Furniture.—12,494, J. Hunt and H. Thame, Covering for Walls, Roofs, &c.—12,512, A. Waddell, Ventilating.—12,526, R. Baird, Slip Ladders.—12,537, A. Waddell and F. Redman, Sanitary Appliance for Water-closets, &c.—12,542, E. Blundstone, Plaster of Paris.

Oct. 4.—12,565, R. Atkinson, Gully for Excluding Sewer Gas.—12,582, C. Maxwell and S. Walker, Baths and Sinks.—12,588, W. Day, Chimney-pot and Ventilator.—12,597, H. Treasure, Lock-up Ventilator for Buildings.—12,683, E. Gotto and F. Beesley, Supplying Water to Water-closets, &c.

Oct. 5.—12,633, K. Peez, Mortise Lock.—12,638, J. Kelly, Telescope Ladder.—12,655, W. Thompson, Cooking Stoves.

Oct. 6.—12,702, E. Booth, Hanging and Opening Casement Windows.—12,711, J. Sanders and H. Thomas, Water Meter, &c.—12,746, P. Blackman, Lift.—12,749, J. Morris, Chimney Pots or Cowls.

Oct. 7.—12,764, W. Harris, Trap for Waste-water Outlets.—12,771, W. Munns, Nail Holder.—12,774, T. Hind and R. Lund, Grinding Paints, &c.

PROVISIONAL SPECIFICATIONS ACCEPTED.

9,438, J. Parker, Composition for Paving Floors, &c.—9,725, W. Lawson, Hoist.—9,748, H. Whiteley, Regulating the Opening and Closing of Fanlights, &c.—9,824, A. Muir, Mitreing Machines.—10,384, G. Nobes, Door Lock.—10,408, J. Wilson, Ventilation of Rooms.—10,464, C. Thornett, Fastening Window-sashes, either shut or partially open.—10,701, H. Sutcliffe, Ventilators for Preventing Down-draught.—10,860, E. Nunn, Bricks for the Reception of Nails, Screws, &c.—11,454, R. Hunter and J. Turnbull, Kitchen Ranges.—11,494, A. McLean and R. Smith, Manufacture of Pigments.—11,596, J. Deeley, Lavatories, Baths, Sinks, &c.—11,792, Viscount Grimston, Water-waste Preventers.—11,827, J. Ashworth, Stench Traps.—11,521, A. and E. Paget, Counters.

COMPLETE SPECIFICATIONS ACCEPTED.

Open to Opposition for Two Months.

14,949, T. Ransome, Fabrics or Materials for Preventing the Spread of Fire in Public and Private Buildings.—15,108, J. Gibson, Cooking Ranges and Stoves.—12,508, A. Kerr, Water-closet Cistern.—15,069, G. Bonehill, Metal Stair Nosings, Floors, &c.—15,004, D. Gill, Room Doors and Doorways.—229, J. Hendra and W. Gooding, Stair-treads, Door-steps, &c.—10,658, W. Withington, Outlet for Sinks, &c.—10,915, H. Haddan, Parquetry.—11,310, A. Fowler, Privies and Water-closets.

RECENT SALES OF PROPERTY.

ESTATE EXCHANGE REPORT.

OCTOBER 5.

By DEBENHAM, TEWSON, & CO.

West Dulwich—Alleyn House, and 1a. 1r. 13p., 56 years, ground-rent 37*l.* 10*s.*	£2,310
Holborn—11, Greville-street, freehold	840

By Messrs. ELGOOD.

Cavendish-square—3, Henrietta-street, 8 years, ground-rent 80*l.*	1,100
Notting-hill—5, Notting Hill-terrace, 36 years, ground-rent 9*l.* 9*s.*	910
Lisson-grove—8, Great James-street, 6 years, ground-rent 7*l.* 7*s.*	50

By H. A. HENDERSON.

Plaistow—92 and 94, Stratford-road, freehold	550
East-road—A plot of freehold land	100

By J. MCLACHLAN & SONS.

Clapham, The Chase—A plot of freehold land	1,325
Small cottage, 27 years, no ground-rent	165

By FLEURET & SON.

Whitechapel—1, Cambridge-road, freehold	1,600
Barnes—3, Northumberland-avenue, 86 years, ground-rent 24*l.*	2,050

By BELTON & SONS.

Barking-road—The Liverpool Arms Public-house, freehold	1,780
Burnham-street—Gilbert's cottage, freehold	490
Wandsworth-road—The Bolingbroke Hotel, freehold	2,110
Fetter-lane—An improved rental of 60*l.* a year, 45 years	710

OCTOBER 6.

By T. B. WESTACOTT.

Ealing—65 and 67, Oxford-road, 76 years, ground-rent 14*l.*	530
Kentish Town—25, Prince of Wales-crescent, freehold	485
Upper Holloway—39, Salisbury-road, 91 years, ground-rent 5*l.*	200
Kentish Town—15, Victoria-road, 51 years, ground-rent 11*l.* 10*s.*	415
Holloway—Ground-rents of 100*l.* a year, reversion in 92 years	250
146, Elthorne-road, freehold	605
14, Milton-grove, freehold	250
34, Hampden-road, freehold	240

By DALE & SON.

Poplar—1 to 5, Stephen's Acre, 14 years, ground-rent 20*l.*	50
Ratcliff—34, 36, and 38, Love-lane, 15 years, ground-rent 35*l.*	70
Mile End—50, Clark-street, 12 years, ground-rent 3*l.*	100
St. George's-in-East—2, Ann-street, 14 years, no ground-rent	55
Mile End—64, Exmouth-street, 15 years, ground-rent 4*l.*	130
Bethnal-green—1 to 5, The Terrace, freehold	2,600
17 and 19, Old Ford-road, freehold	1,860
Land tax of 19*l.* 4*s.* a year	490

By BELTON & SON.

Upper Holloway-road—No. 585, term 71 years, ground-rent 12*l.* 10*s.*	500
Holloway-road—Ground-rent of 25*l.* a year, reversion in 18 years	530
Holborn—15, Leather-lane, freehold	1,250
Upper Mitcham—Two cottages, a house and shop, and four plots of land, freehold	1,430
Stoke Newington—177, High-street, copyhold	1,030

By C. R. CROSS.

Wandsworth-55, High-street, freehold	1,500
Battersea—32 and 33, Doddington-grove, 67 years, ground-rent 2*l.*	565

OCTOBER 7.

By HARDS & JENKINSON.

Balham—The residence called Kingthorpe House, 49 years, no ground-rent	2,140
Jamaica—The Flamstead, Mount Elizabeth, Rosanna, Mount Trafalgar, and part of Mount Henry Sugar Estates, 912 acres	1,120

By J. A. & W. THARP.

Sutton—207 to 213 odd, High-street, 62 years, ground-rent 2*l.* 10*s.*	625
Leatherhead, Kingston-road—A plot of copyhold land	50
North-street—Six copyhold cottages	450
Fair Field—Four copyhold cottages	300

By C. D. FIELD & SONS.

Holloway-road—Ground-rent of 8*l.*, reversion in 15 years	1,660
6, George's-road, and a plot of land, freehold	1,260
The freehold beer-house, the White Hart	800
10 to 28 even, George's-road, and 11 to 18, Milton-place, freehold	2,810

October 8.

By Baker & Sons.

Islington—40 and 41, North-street, 37 years, ground-rent 10*l.* 10s.	£720

By W. A. Blakemore.

Regent's Park—The lease of 1 and 1A, Upper Park-place, term 11¾ years	170

MEETINGS.

Saturday, October 16.

Liverpool Architectural Society.—Visit to Rainhill Asylum. Train leaves Lime-street Station at 2·15 p.m.

Monday, October 18.

Royal Academy.—Professor John Marshall on "Anatomy." IV. 8 p.m.

Tuesday, October 19.

Institute of British Carriage Manufacturers.—Professor John Macoun on "Canadian Timbers suitable for Carriage-Building" (Town Hall, Westminster). 7 p.m.

Manchester Architectural Association.—*Conversazione* in Lecture Hall of the Athenæum. 7·30 p.m.

Society of Antiquaries of Scotland.—Rhind Lectures in Archæology. I. By Professor David Masson (Masonic Hall, Edinburgh). 8 p.m.

Wednesday, October 20.

Royal Academy.—Professor John Marshall, on "Anatomy." V. 8 p.m.

Friday, October 22.

Architectural Association.—Opening Address by the President, Mr. J. A. Gotch. 7·30 p.m.

Royal Academy.—Professor John Marshall on "Anatomy." VI. 8 p.m.

Bradford Historical and Antiquarian Society.—Mr. J. P. Pritchett, F.R.I.B.A., on "The Great Mediæval House of Neville." 7·30 p.m.

Society of Antiquaries of Scotland.—Rhind Lectures in Archæology. II. By Professor David Masson. 8 p.m.

Miscellanea.

The Sold Portions of the Buccleuch Estate.—Sir J. Whittaker Ellis, M.P., has purchased as a residence the Buccleuch mansion on the estate which is about to be acquired by the Richmond Vestry as pleasure-grounds for the people. The price is 6,000*l.* There is very little ground attached to the house beyond the lawn, which, according to the conditions of the purchase, is to remain intact. The proposal to continue through the lawn the towing-path has been abandoned, as not affording advantages equal to the great expense and depreciation of property involved in the construction in the path. Sir J. Whittaker Ellis intends, it is believed, to make the mansion his own residence. General satisfaction is expressed in the town that this part of the estate has fallen into the hands of so public-spirited a native of Richmond as the gentleman mentioned, who has also promised a donation of 500*l.* towards the expense of substituting an open railing for the wall which now encloses the upper grounds. The Three Pigeons, which formed part of the estate, has been purchased by Mr. Messum, the well-known boat-builder, for 5,000*l.*, while it is believed that the Vestry have an offer of 4,000*l.* for the stables. The Richmond Vestry will thus realise 15,000*l.* from the sold portion of the estate. The Vestry are, as previously announced, empowered to raise a loan for the balance of the purchase-money.

Drainage Inquiry at Acton.—Major Tulloch, R.E., Local Government Board Inspector, held an inquiry on the 7th inst. at the offices of the Acton Local Board in respect to an application for sanction of a loan to borrow 25,000*l.* for works of sewage and sewage disposal. Mr. MacSwinney, who appeared for the Local Board, stated that the loan for which the Board now asked power to raise was part of the sum originally applied for (75,000*l.*) to carry out the whole of the new drainage works, but the Local Government Board had given its sanction from time to time to only portions of the loan, so that it might have some control over the expenditure and works. The scheme was originally prepared by Sir Joseph Bazalgette, but since then the Board had, by the advice of its surveyor and Mr. William N. Lailey, and the approval of Sir Joseph, diminished the proposed size of the effluent sewer through Chiswick to the Thames, so as to obviate probable objections on the part of Chiswick authorities and private owners. The pipe was diminished from 5 ft. to 2 ft. diameter, and an additional tank for the storage of the effluent water at the pumping station during flow tides has been erected to meet the circumstances arising from the reduced capacity of this sewer. By this alteration a saving of no less a sum than 7,000*l.* was effected. With regard to the proposed treatment of the sewage the Board were still in negotiation with the Native Guano Company to treat it on the ABC system, but it was possible that this might fall through, and, if so, the Board would probably treat it. The tanks for which a contract with Messrs. Mowlem & Co. existed would be available for any system that might be adopted. Mr. Hardy, a ratepayer, persisted in criticising the action of the Board, notwithstanding that the Inspector told him the case of the Local Board should be heard first. Major Tulloch stated that, if interrupted in the proceedings, he would pack up his books, and the Local Government Board, which was not bound to hold an inquiry, could get what information it wanted otherwise. Mr. Lailey, the Acton surveyor, Mr. Jones, the Ealing surveyor, gave evidence in regard to the desirableness of the alterations, and the inquiry closed, Major Tulloch remarking that the Local Government Board were satisfied with the effectiveness of the scheme.

The Recent Case of Suffocation in a Well.—A painful story of death from misadventure, which in this as in so many other cases means death from ignorance or carelessness, was investigated the other day by Dr. Danford Thomas. A prisoner in Pentonville Gaol volunteered, with a colleague, to descend a disused well for the purpose of removing pumps. The danger of such a proceeding is manifest, and it is reported that the authorities were warned of the danger, and the jury certainly appended a censure to their verdict. One of the men died, and the other was so much affected that he had to go to a hospital. It is scarcely necessary to remind our readers that the utmost caution should be used before entering any well or confined space. Carbonic acid generates under a variety of conditions, and its action, even in small quantity, is not only poisonous, but paralysing. The candle test is, when properly used, sufficient. If the candle burns clear and bright to the very bottom, there is no danger; but if it does not go to the bottom, there is always a possibility that carbonic acid, which is half as heavy again as air, may lie there, as in the celebrated Grotto del Cane, in which a man can stand, while a dog is asphyxiated. It is commonly supposed that carbonic acid accumulates only in old or disused wells. This is a dangerous delusion. We were present a few years ago at an inspection of a new well on the estate of our lamented editor, the late Dr. Wakley. The well had only been sunk a few weeks before in a country place remote from houses. It was loosely covered, and one of the men was about to descend for the purpose of inspection, when Dr. Wakley, with characteristic caution, insisted that a candle should be lowered first. It went out before it had gone 6 ft.; and it is certain that if the man had gone done, as he proposed, he would have fallen lifeless to the bottom. The generation of carbonic acid below the surface of the earth is apparently capricious. The curious pits or caves, some of them more than a 100 ft. in depth, which abound in the neighbourhood of Bexley, in Kent, contain no carbonic acid, as we can testify from personal experience, although they are said to have been excavated in prehistoric times; whereas, as in the instance already quoted, the gas may accumulate in a perfectly new chamber. The mere extinction of a flame is not a sufficient indication of danger. If the candle burns dimly there is risk, for the gas acts on living beings as on candles, and insensibility, or exhaustion tantamount to it, may be produced by a quantity of carbonic acid which would not immediately kill.—*Lancet.*

Birmingham Architectural Association. On Saturday afternoon last the members of this Association made a visit to the new premises for the Staffordshire Joint Stock Banking Company, and the new Rectory now nearly completed for Canon Bowlby, rector of St. Philip's Church, Birmingham. The two buildings adjoin each other, and form very prominent features at one angle of the churchyard abutting in Temple-row. Mr. W. Doubleday is the architect of the new bank, which is built of Bath stone in a somewhat free Classic style. The total cost of the building, exclusive of shopping and offices, which are to be added, is about 11,000*l.* Messrs. Bennett & Son, of Sheffield, are the contractors. Messrs. Osborn & Reading are the architects to the Rectory, which is faced with Hollington stone, and built in the Renaissance style of architecture. Messrs. Barker & Son, of Birmingham, are the contractors. After a close inspection of the many interesting details of both buildings, the members dispersed about five p.m.

Sale of Two Building Estates at Harold Wood.—On Monday last Messrs. Baker & Sons, who have held two sales of the property within the last few weeks, sold the remaining portion of the Oakleigh Park Estate. The number of lots submitted was 132, most of which have frontages varying from 15 ft. to 18 ft., and depths of 100 ft. to 130 ft., the prices realised ranging from 10*l.* to 18*l.* each. A corner tavern plot, at the extreme north boundary of the estate, facing Squirrel's Heath-road, the main high road from Romford to Upminster, having a frontage of 29 ft. to Squirrel's Heath-road, but narrowing to about 15 ft. in the rear, and a return frontage of 126 ft. to Archibald-road, caused a very close and warm competition between two bidders. The biddings commenced at 20*l.*, and the property was ultimately sold for 106*l.*, being at the rate of about 1,400*l.* an acre. The conditions stipulated that not less than 400*l.* is to be expended in the erection of the hotel. A plot at the north-west portion of the estate, bounded by Ingrebourne Brook, having a frontage of 15 ft. and a depth of 280 ft., with a large area in the rear, enclosed east and west by the brook, was sold for 57*l.* The estate, upon which upwards of 400 houses and shops are to be erected, has realised an average of from 350*l.* to 400*l.* an acre. Having disposed of the above-named property, the auctioneer next submitted the Avenue-road Estate, situated on the south side of the railway, and also close to the Harold Wood Station. The estate is about six acres in extent, and has been divided into eighty-two plots, all of which were offered. Nearly the whole of the plots have frontages of 17 ft., and depths of 70 ft., the prices realised for the private house plots being from 8*l.* to 12*l.* each, and for the shop plots 15*l.* and 16*l.* each. An hotel plot, having a frontage of 25 ft., and a return frontage of 65 ft., realised 64*l.*

The Queen's Park Estate at Loughton.—On Monday evening Messrs. Croucher & Co. offered for sale, as the Crown Hotel, Loughton, the second and remaining portion of the Queen's Park Estate, situated on the borders of Epping Forest, and within a short distance of Loughton Station on the Woodford, Loughton, and Ongar branch of the Great Eastern Railway. The estate occupies an area of about 15 acres, and has been laid out for the erection of about 130 private residences. That portion of the estate facing the high road from London to Epping was sold a few weeks since, and the lots offered on Monday last, sixty-four in number, consisted of the central part of the estate, on each side of Queen's-road, a new road 50 ft. in width, which has just been formed. There was a very large attendance, the sale-room being much crowded. The several plots have frontages of 25 ft. each, varying in depth from 180 ft. to 212 ft. With few exceptions all the lots were sold, the smaller lots realising from 25*l.* to 28*l.* each, whilst those having a depth of 200 ft. and upwards were sold at from 33*l.* to 36*l.* each. A corner plot, having a frontage of 54 ft. to Queen's-road, and 195 ft. to Pump Hill, realised 76*l.*; and another corner plot, having a frontage of 110 ft. to Queen's-road, and a depth of 150 ft. to York Hill, was sold for 136*l.*

Evening University Lectures at King's College, London.—Special courses of lectures, commencing on October 25, will be given at King's College during the ensuing Winter Session of the Evening Classes. The subjects will chiefly be treated with a view to assisting independent study. Among the courses will be the following, viz., "Iron and Steel," by Mr. Walter G. McMillan, F.C.S. In this course it is proposed to treat of the general methods by which the different qualities of malleable iron, cast iron, and steel may be produced and prepared for use in the Arts; of the effect of the various foreign substances contained in these metals upon their strength and fitness for the purposes to which they are to be applied; of the extent to which these substances are injurious, and the means by which they are commonly eliminated.—"The Geometry of Newton," by Professor W. H. H. Hudson, M.A. This course will consist of detailed explanations and illustrations of Newton's reasoning, and also of applications of Newton's method to the geometry of certain particular curves of practical importance.—"The Roman, Etruscan, and Græco-Roman Monuments in the British Museum," by Professor G. C. Warr, M.A. The object of these lectures is to explain the historical monuments and art collections in the above departments of the British Museum.

The New Street through "The Mint," Southwark.—The long-delayed new street through that notorious locality known as "The Mint," in the Borough, is at last in course of formation. The haunts of Jack Sheppard and Jonathan Wild are now no more. The *Southwark Standard* says with regard to the improvement that in 1840 the late Mr. A. J. Hiscocks, F.R.I.B.A., District Surveyor of Wandsworth and Tooting, succeeded in obtaining the necessary Parliamentary powers for the formation of a street from Blackman-street to Rowland Hill's Chapel, Great Charlotte-street, Blackfriars-road. The construction of Southwark-street was the reason for abandoning this scheme. The author of the present scheme for the formation of a new street, 60 ft. wide, from Blackman-street to Southwark Bridge-road, is Mr. A. Hiscocks, C.E., the present Surveyor to the parish of St. George-the-Martyr, who in 1875 took an active part in urging the Vestry to take the necessary steps to obtain Parliamentary powers for its construction, which were obtained in 1877. The Industrial Dwellings erected by Sir Sydney Waterlow's Company in the Mint will afford ample accommodation for the persons whose houses have been demolished, the new buildings being replete with every convenience, both as to sanitary and domestic requirements. The South-Eastern Railway Company are responsible for much of the delay that has occurred in carrying out this improvement, in consequence of their requiring some of the property already taken for the street for their proposed new lines and widenings, crossing the line of the new street. This scheme has for the present been abandoned. The Vestry of the Parish of St. George-the-Martyr, Southwark, and their surveyor, are certainly entitled to the thanks of the community at large for the good work they have done in disposing of the nest of feverdens and haunts of infamy that existed in the midst of one of the most densely populated and busiest localities in the metropolis. There is no doubt that the construction of this street will have the effect of relieving the congested state of the traffic of London Bridge by the diversion of the traffic through the new street over Southwark Bridge. The new street will debouch in the Borough High-street opposite to Great Dover-street (the approach to the Old Kent-road), thus forming a link in a continuous main thoroughfare between Wandsworth and Vauxhall (*vid* Albert Embankment) and Greenwich.

Brickmaking under new Conditions.—Under this heading the *Rochester and Chatham News* gives some account of the means which are now being employed in that neighbourhood to convey brick clay in a diluted fluid state from the ground where it is found, to the brick-fields in pipes. The brick manufacturer is enabled, by means of Messrs. Taylor & Neate's slurry pumps, to prepare his earth upon the site from whence he draws his supply, and convey it thence in a liquid state through iron mains to the brickfield where it is presently to be converted into bricks. Messrs. Smeed, Dean, & Co., of Sittingbourne, who are very large brickmakers, have lately obtained an enormous supply of fresh brick-earth from a property about a quarter of a mile east of Tonge Church, and, nearly two miles distant from their present brickfields, Messrs. Taylor & Neate are carrying out engineering works which will enable the company to utilise their purchase at their existing brickfields. The most important feature of the undertaking is the set of pumps for pumping the washed brick-earth through a cast-iron pipe main to the brickfields. The pumps are designed to deliver sufficient brick-earth to make 1¼ million of bricks per week.

New Government Offices at Christiania. The Norwegian Government have decided upon building a modern block of Government offices at Christiania, those now in use being old dwelling-houses spread over the town, and wholly unsuitable to present requirements. As yet, however, no invitations of tenders for design have been issued, the committee appointed for considering this question not having been able to decide whether the various departments should be located in one vast hall, presided over by the departmental chief, or in several minor offices. There is every probability of the former plan being adopted, and it is the intention of the Government to make the building worthy of the nation.

PRICES CURRENT OF MATERIALS.

TIMBER.	£.	s.	d.	£.	s.	d.
Greenheart, B.G. ....ton	6	10	0	7	0	0
Teak, E.I. ....load	9	0	0	14	0	0
Sequoia, U.S. ....foot cube	0	2	4	0	2	7
Ash, Canada ....load	3	0	0	4	10	0
Birch ,, ...	2	10	0	4	0	0
Elm ,, ...	3	10	0	4	10	0
Fir, Dantsic, &c.	1	10	0	4	0	0
Oak ,, ...	2	10	0	4	10	0
Canada	3	0	0	6	0	0
Pine, Canada red	2	0	0	3	10	0
,, yellow	2	5	0	4	0	0
Lath, Dantsic ....fathom	3	0	0	5	0	0
St. Petersburg	4	0	0	5	10	0
Wainscot, Riga ....log	2	15	0	4	0	0
,, Odessa, crown....	3	5	0	3	7	6
Deals, Finland, 2nd and 1st...std.100	7	0	0	8	0	0
,, 4th and 3rd	6	0	0	7	0	0
Riga	5	10	0	7	0	0
St. Petersburg, 1st yellow	8	0	0	14	0	0
,, 2nd ,, ...	7	0	0	8	0	0
,, white	7	0	0	10	0	0
Swedish	6	0	0	15	0	0
White Sea	7	0	0	17	10	0
Canada, Pine, 1st	17	0	0	30	0	0
,, ,, 2nd	12	0	0	17	0	0
,, ,, 3rd, &c....	6	0	0	10	0	0
,, Spruce, 1st	8	0	0	11	0	0
,, ,, 3rd and 2nd	5	0	0	7	10	0
New Brunswick, &c....	5	0	0	7	0	0
Battens, all kinds	4	0	0	12	0	0
Flooring Boards, sq. 1 in., Prepared, first	0	9	0	0	13	0
Second	0	7	6	0	8	6
Other qualities	0	5	0	0	7	0
Cedar, Cuba ....foot	0	0	3	0	0	3½
Honduras, &c.	0	0	2½	0	0	3½
Australian	0	0	2	0	0	3
Mahogany, Cuba	0	0	4	0	0	7
St. Domingo, cargo average	0	0	4	0	0	7
Mexican ,, ...	0	0	3½	0	0	4½
Tobasco ,, ...	0	0	4	0	0	6½
Honduras ,, ...	0	0	4½	0	0	6½
Maple, Bird's-eye	0	0	6	0	0	8
Rose, Rio ....ton	7	0	0	10	0	0
Bahia....	6	0	0	10	0	0
Box, Turkey	5	0	0	17	0	0
Satin, St. Domingo ....foot	0	0	7	0	0	11
Porto Rico	0	0	8	0	1	2
Walnut, Italian	0	0	4	0	0	5

METALS.	£.	s.	d.	£.	s.	d.
Iron—Pig, in Scotland....ton	0	0	0	0	0	0
Bar, Welsh, in London	4	7	6	4	15	0
,, ,, in Wales	4	2	6	4	7	6
,, Staffordshire, London	5	10	0	6	0	0
Sheets, single, in London	6	15	0	8	10	0
Hoops ,, ...	6	0	0	7	0	0
Nail-rods ,, ...	5	10	0	6	10	0
Copper—						
British, cake and ingot ....ton	43	0	0	43	10	0
Best selected	44	10	0	0	0	0
Sheets, strong....	52	0	0	0	0	0
,, India	0	0	0	0	0	0
Australian	0	0	0	0	0	0
Chili, bars	41	15	0	42	2	6
Yellow Metal ....lb.	0	0	0	0	0	0
Lead—						
Pig, Spanish ....ton	12	12	6	0	0	0
English, common brands....	12	17	6	0	0	0
Sheet, English	13	15	0	13	17	6
Spelter—						
Silesian, special ....ton	14	5	0	0	0	0
Ordinary brands....	14	0	0	14	2	6
Tin—						
Banca ....ton	0	0	0	0	0	0
Billiton	0	0	0	0	0	0
Straits	101	12	6	0	0	0
Australian	102	0	0	0	0	0
English ingots	105	0	0	0	0	0
Zinc—						
English sheet ....ton	18	0	0	18	5	0
OILS.						
Linseed ....ton	20	5	0	20	10	0
Cocoanut, Cochin	33	5	0	0	0	0
Ceylon	25	15	0	0	0	0
Copra	0	0	0	0	0	0
Palm, Lagos	23	0	0	0	0	0
Palm-nut Kernel	0	0	0	0	0	0
Rapeseed, English pale	21	15	0	0	0	0
,, brown	20	5	0	0	0	0
Cottonseed, refined	17	10	0	19	0	0
Tallow and Oleine	25	0	0	45	0	0
Lubricating, U.S.	6	0	0	10	0	0
,, refined	8	0	0	13	0	0
Turpentine—						
American, in casks ....cwt.	1	8	6	0	0	0
Tar—						
Stockholm ....barrel	0	15	0	0	15	6
Archangel	0	10	6	0	11	0

CONTRACTS.

Epitome of Advertisements in this Number.

Nature of Work, or Materials.	By whom required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.	Page.
Stoneware Socketed Drain Pipes	Enfield Local Board ...	W. Kitteringham	October 20th	ii.
Sanitary Improvements	Chichester Infirmary...	Mark H. Judge	October 25th	xviii.
Making-up Roads	Wandsworth Bd. of Wks	*Official*	October 26th	ii.
Erection of Swing Bridge	Hull Corporation.....	A. E. White	do.	ii.
Homestead	Bor. of Burton-on-Trent	R. Waite.....	do.	ii.
Coals, Drain-Pipes, and Stores	Croydon Town Council	*Official*	do.	ii.
Road Formation and Construction	East Barnet Valley L. B.	do.	October 30th	ii.
Waterworks	Devonport Water Co....	T. & C. Hawksley	Nov. 1st	ii.
Hand Broken Guernsey Granite	Finchley Local Board	G. W. Brumell.....	do.	ii.
Rebuilding Pike Mills, Kidderminster	Watson Bros. & Co.....	J. T. Meredith	Nov. 3rd	ii.
Construction of small Landing Pier....	Rochester Corporation	*Official*	Nov. 6th	ii.
Sewerage Works	Sevenoaks R.S.A.	J. G. Hall, C.E.	Nov. 9th	ii.

TENDERS.

BROADSTAIRS.—For 5,000 ft. of granite kerbing, 12 ft. by 6 ft., for the Broadstairs and St. Peter's Local Board. Mr. E. L. Elgar, surveyor:—

	Delivered at Broadstairs. s. d.		Ramsgate. s. d.
Mowlem & Co.	1 6	.....	—
Treherne & Co.	1 5½	.....	—
Blower & Florence	1 5	.....	—
Story	1 2	.....	—
Tuckett & Sons....	—	.....	1 1
Manville	1 1½	.....	—
Chalk	1 0½	.....	0 11½
Garden	0 11½	.....	0 11
West of England Co.*	0 9½	.....	—

* Accepted.

Beach.

Whiting.... 6s. per yard.
Reader .... 6s. per yard.

CAMDEN TOWN.—For stabling, Delancey-street, Camden Town. Mr. C. R. Baker King, architect. Quantities by Messrs. J. S. Lee & Sons:—

Buckeridge	£3,400	0	0
Laing & Son	3,124	0	0
Paine Bros.	3,070	0	0
Castle	2,873	0	0
Manning	2,835	0	0
Dove Bros....	2,795	0	0
Martin	2,793	0	0
Manley....	2,767	0	0
Salt	2,757	0	0
Pattinson....	2,750	0	0
Robson....	2,740	0	0
Evans	2,739	0	0
Roper	2,737	0	0
Toms....	2,717	0	0
Battley....	2,696	0	0
Dobson....	2,595	0	0
Wall Bros.*	2,574	0	0

* Accepted with reductions.

ENFIELD.—For additions and repairs, &c., to Chase Hill House, Enfield, Middlesex, for Mr. A. G. Kitching, J.P. Mr. W. D. Church, architect, South-place, Finsbury. Quantities by Mr. C. Stanger, Finsbury-pavement:—

Field & Son	£2,333	0	0
J. Holloway	2,031	0	0
W. Shurmur	2,027	0	0
S. Godden	1,935	0	0
J. Patman	1,838	0	0
Fairhead & Son....	1,797	0	0

KENSINGTON.—For completing and finishing the residences situate and being Nos. 98, 100, 102, 104, 110, 112, 114, and 116, Baron's Court-road, West Kensington, for Messrs. Hoare & Co. Messrs. Rogers, Chapman, & Thomas, surveyors, Belgrave-road:—

G. T. Smith & Son	£1,448	0	0
Prestige & Co.	1,434	0	0
E. D. Hook....	1,413	0	0
H. Smith & Son....	1,235	0	0
Corden & Son (accepted)	879	0	0

LONDON.—For additions to the Congregational Memorial Hall, Farringdon-street. Mr. W. D. Church, architect, South-place, Finsbury. Quantities by Mr. C. Stanger, surveyor, Finsbury-pavement:—

	Total.	Alternative estimate. No. 1.		Alternative estimate. No. 2.
Colls & Sons	£10,500	... £375	...	£1,213
Dove Bros....	10,445	... 130	...	1,100
Ashby Bros.	10,250	... 140	...	1,025
Patman & Fotheringham	10,140	... 160	...	985
Perry & Co.	9,956	... 115	...	1,162
Shurmur....	9,900	... 150	...	950
Hall, Beddall, & Co.	9,710	... 243	...	1,082
Nightingale	9,700	... 120	...	1,060
Higgs & Hill....	9,615	... 82	...	1,074
Woodward....	9,600	... 70	...	1,113
J. Holloway	9,500	... 130	...	920
Brass & Son	9,333	... 200	...	1,050

LONDON.—For proposed new Fire Brigade Station, Great Marlborough-street, Regent-street, for the Metropolitan Board of Works. Mr. George Vulliamy, architect. Messrs. Nixon & Raven, surveyors:—

Higgs & Hill	£9,340	0	0
W. Martin	8,795	0	0
Wall Bros.	8,790	0	0
C. Wall	8,699	0	0
Staynes & Son	8,583	0	0
Howell & Son	8,490	0	0
Mowlem & Co.	7,880	0	0
W. Brass & Son	7,873	0	0
Johnson	7,815	0	0
Oldrey	7,690	0	0
Stimpson & Co. (accepted)	7,660	0	0

LONDON.—For alterations to 47, Buckingham Palace-road. Mr. H. J. Treadwell, surveyor, Agar-street, Strand:—

Kiddle & Son	£2,655	15	0
Styles & Son	2,635	0	0
Grover & Son	2,578	0	0
G. & H. A. Bywaters	2,483	0	0
Drew & Cadman	2,300	0	0

LONDON.—For lying-in wards at the New Workhouse, Garratt-lane, Wandsworth, for the Guardians of the Poor of the Wandsworth and Clapham Union. Mr. Thomas W. Aldwinckle, architect, East India-avenue, E.C. Quantities by Messrs. S. Young and W. B. Brown:—

Jewell	£2,142	0	0
Green	2,073	0	0
Church & Son	1,999	0	0
T. Holloway	1,950	0	0
A. & E. Braid	1,950	0	0
J. M. Macey & Son	1,853	0	0
Howell & Son	1,850	0	0
H. L. Holloway	1,847	0	0
Kirk Bros.	1,840	0	0
Staines & Son	1,839	0	0
Peters	1,825	0	0
Simmons	1,820	0	0
Turtle	1,793	0	0
Battley	1,788	0	0
Stephenson	1,771	0	0
Nightingale	1,769	0	0
W. Johnson	1,750	0	0
Mowlem & Co.	1,683	0	0
Kirk & Randall	1,664	0	0
D. Brown & Co.	1,647	0	0
Hammond, Battersea (accepted)	1,548	0	0
W. G. Wyatt & Co. (withdrawn)	1,475	0	0

LONDON.—For alteration at the Feathers, Great Chapel-street, Westminster, for Mr. C. Gurney. Mr. H. E. Pollard, architect, Duke-street, Adelphi:—

Vears & Co.	£470	0	0
Lang & Son	383	0	0
Richardson	349	0	0
Jackson & Todd	348	0	0
Ward & Lamble (accepted)	339	0	0

LONDON.—For new back addition and alterations to No. 42, Beaumont-street, Portland-place, for the Misses Wilson. Messrs. Habershon & Fawckner, architects, Bloomsbury-square:—

W. Groom, Dulwich (accepted)	£531	0	0

MAIDENHEAD.—For residence, with conservatory and stables, at Maidenhead Court, Maidenhead, for Mr. W. Ratcliff. Mr. Geo. Pearson, architect, Warnford-court:—

W. Creed, Maidenead	£2,009	0	0
C. W. Cox, Maidenhead	1,990	0	0
Snell & Co., Maidenhead	1,990	0	0
W. Woodbridge, Maidenhead	1,980	0	0
Little & Seneeal, London*	1,747	0	0

* Accepted.

PADDINGTON.—For pewtering work at the Redan, Westbourne-grove, for Mr. Veale. Mr. F. J. Eedle, architect:—

J. Warne	£107	0	0
T. Heath	91	0	0
W. Helling (accepted)	78	18	6

SOUTH TOTTENHAM.—For an addition and shop front to house, South Tottenham. Mr. J. W. Couchman, architect:—

G. L. Wilson & Co.	£202	10	0
Groves	198	19	0
H. Knight & Son	159	10	0

STRATFORD.—For the erection of new drill-hall and stabling in The Green, for the 2nd Volunteer (Essex) Brigade Eastern Division Royal Artillery. Mr. James F. Wesley, architect, Forest-gate. Quantities supplied:—

	Hall.			Stabling.		
Hearle & Son	£660	0	0	£223	0	0
J. W. Wyles	675	11	0	196	6	0
S. Davis	606	0	0	171	10	0
J. A. Taylor	639	0	0	205	0	0
M. Gentry	635	0	0	189	0	0
J. Walker	570	0	0	200	0	0
M. A. Palmer & Co.	599	0	0	160	0	0
W. Watson	591	10	0	153	10	0
J. Brickell	500	0	0	155	0	0

For Iron Roof to Drill Hall.

Walker Bros.	£445	0	0
Gospel Oak Iron Co.	439	0	0
Croggon & Co.	245	10	0
Whitford & Co.	235	0	0

For Repairs and Painting, &c., at the Head Quarters.

J. T. Robey	£355	0	0
J. W. Wyles	346	19	9
J. Walker	338	0	0
A. & A. Emmott	235	10	0

WOODFORD-GREEN.—For villa residences at Woodford-green, Woodford, Essex, for Mr. J. R. Roberts. Mr. J. Kingwell Cole, architect:—

J. O. Richardson	£2,944	and	£3,830
Bentley	2,921	,,	2,671
Wells	2,883	,,	2,456
Wall Bros.	2,666	,,	2,420
Perry & Co.	2,640	,,	2,610

Premises, Bishopsgate-street.—By a printer's error in the list of tenders for the erection of premises, No. 104, Bishopsgate-street, London, in our last, the amount of Mr. B. E. Nightingale's tender was put at 5,129*l.* It should have been 7,129*l.*

St. Clement's Vicarage, Fulham.—By another typographical error the firm whose tender has been accepted for this work was stated to be "Holland & White"; it should have been "*Howland* & White."

SPECIAL NOTICE.—Lists of Tenders frequently reach us too late for insertion. They should be delivered at our office, 46, Catherine-street, W.C., *not later than Four p.m.* on THURSDAYS.

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DOUGLAS FOURDRINIER, Publisher,
Addressed to No. 46, Catherine-street, W.C.

Advertisements for the current week's issue must reach the Office before THREE o'clock p.m. on THURSDAY.

The Publisher cannot be responsible for DRAWINGS, TESTIMONIALS, &c. left at the Office in reply to Advertisements, and strongly recommends that of the latter COPIES ONLY should be sent.

SPECIAL.—ALTERATIONS in STANDING ADVERTISEMENTS or ORDERS TO DISCONTINUE same, must reach the Office before TEN o'clock on WEDNESDAY mornings.

PERSONS Advertising in "The Builder," may have *Replies addressed to the Office, 46, Catherine-street, Covent Garden, W.C. free of charge.* Letters will be forwarded if addressed envelopes are sent, together with sufficient stamps to cover the postage.

TERMS OF SUBSCRIPTION.

"THE BUILDER" is supplied DIRECT from the Office to residents in any part of the United Kingdom at the rate of 19s. per annum PREPAID. To all parts of Europe, America, Australia, and New Zealand, 26s. per annum. To India, China, Ceylon, &c. 30s. per annum. Remittances payable to DOUGLAS FOURDRINIER, Publisher, No. 46, Catherine-street, W.C.

AN EDITION Printed on THIN PAPER, for FOREIGN CIRCULATION, is issued every week.

TO CORRESPONDENTS.

Registered Telegraphic Address, "THE BUILDER, LONDON."

D. B.—T. C. M.—T. & N.—T. A. (amounts are wanting).—H. & Co. (ditto).

All statements of facts, lists of tenders, &c., must be accompanied by the name and address of the sender, not necessarily for publication.

We are compelled to decline pointing out books and giving addresses.

NOTE.—The responsibility of signed articles, and papers read at public meetings, rests, of course, with the authors.

We cannot undertake to return rejected communications.

Letters or communications (beyond mere news-items) which have been duplicated for other journals, are NOT DESIRED.

All communications regarding literary and artistic matters should be addressed to THE EDITOR; all communications relating to advertisements and other exclusively business matters should be addressed to THE PUBLISHER, and not to the Editor.

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FARLEIGH DOWN, }

BOX GROUND. COMBE DOWN.
WESTWOOD GROUND.

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Bath Stone.

BEST QUALITY OF ALL KINDS.

PICTOR & SONS,
BOX, WILTS. [ADVT.

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Doulting Free Stone / **HAM HILL STONE,** / **BLUE LIAS LIME** / (Ground or Lump), For prices, &c., address S. & J. STAPLE, Quarry Owners, Stone and Lime Merchants, Stoke-under-Ham, Ilminster. [ADVT.

Asphalte.—The Seyssel and Metallic Lava Asphalte Company (Mr. H. Glenn), Office, 38, Poultry, E.C.—The best and cheapest materials for damp courses, railway arches, warehouse floors, flat roofs, stables, cow-sheds, and milk-rooms, granaries, tun-rooms, and terraces. [ADVT.

Asphalte.

Seyssel, Patent Metallic Lava, and White Asphaltes.
M. STODART & CO.
Office:
No. 90, Cannon-street, E.C. [ADVT.

MICHELMORE & REAP,
Manufacturers of

COLLINGE'S PATENT HINGES, LEVER, SCREW, & BARREL BOLTS,
Self-Acting "FALL DOWN" GATE STOPS,
and IMPROVED GATE FITTINGS of every Description
36A, BOROUGH ROAD,
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